MOTOROLA

Service Manual

**CDMA 800/AMPS-V2260, T2260**
**CDMA Dual Mode 800-1900-V2267, T2267**

# CDMA

COMPUTER SOFTWARE COPYRIGHTS

The Motorola products described in this instruction manual may include copyrighted Motorola computer programs stored in semi-conductor memories or other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this instruction manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

MOTOROLA

*Cellular Subscriber Sector*

# CONTENTS

**CDMA 800/AMPS-V2260, T2260**
**CDMA Dual Mode 800-1900-V2267, T2267**


**Preface . . . . . 5**
Major Differences Shark &ST800 Manta . . . . . 5
General Shark Logic Circuit . . . . . 6
Shark RF circuit . . . . . 7
Performance Specifications General . . . . . 9
Overall System . . . . . 10
Environmental . . . . . 11

**Foreward . . . . . 12**
Scope of Manual . . . . . 12
Replacement Parts Ordering . . . . . 12
Service . . . . . 13
General Safety Information . . . . . 13
Portable Operation . . . . . 13
Mobile Operation . . . . . 13

**Description . . . . . 14**
Overall Concept . . . . . 14
Operation . . . . . 14
Service Area . . . . . 15

**Theory of Operation . . . . . 16**
AMPS Receiver Circuitry . . . . . 16
AMPS Transmitter Circuitry . . . . . 16
CDMA Receiver Circuitry . . . . . 16
CDMA Transmitter Circuitry . . . . . 16
Frequency Synthesizer Circuitry . . . . . 17
Transmit Power Control Circuitry . . . . . 17
Receive Audio Amps Mode . . . . . 17
Receive Audio CDMA Mode . . . . . 17
Transmit Audio Amps Mode . . . . . 17
Transmit Audio CDMA Mode . . . . . 18
Audio Logic block diagram . . . . . 19
Forward Audio Functionality . . . . . 20
Logic Circuitry description CDMA Basel-Start . 21
CDMA Base stand Re Path . . . . . 22
AMPS receiver Block Diagram . . . . . 24
AMPS Transmitter Block Diagram . . . . . 25
Block Diagram of PCS receiver . . . . . 27
Tx Block Diagram . . . . . 27
PCS Transmitter Block Diagram . . . . . 28

**Tests and Adjustments . . . . . 29**
Introduction . . . . . 29
Test interface . . . . . 29
Adjustments . . . . . 29
Connections for testing and adjustments . . . . . 30
Keypad Button Functions . . . . . 31
TX Output Power Adjustments (center Of Band) 31
Maximum Deviation Adjust . . . . . 32
Microphone Deviation Adjust . . . . . 32
DTMF Adjust . . . . . 32
SAT Deviation Adjust . . . . . 33
Data Deviation Adjust . . . . . 33
RX Discriminator Adjust . . . . . 33
Amps Call Processing . . . . . 33
CDMA Call Processing . . . . . 34

**Testing . . . . . 36**
Test Mode Test menu . . . . . 36
Introduction . . . . . 36
Status Display Level . . . . . 36
Servicing Level . . . . . 36
CDMA Specific Features . . . . . 36
Test Menu . . . . . 36
Markov Calls . . . . . 37
Service Option 2 . . . . . 37
Test Mode . . . . . 38
Handset Commands . . . . . 38
Nam Programming . . . . . 48
Introduction . . . . . 48
Test Mode Programming . . . . . 48
Test Mode NAM Programming Sequence . . . . . 49

**Disassembly . . . . . 55**



© 2000 Motorola, Inc.

Introduction . . . . . 55
Recommended Tools . . . . . 55
Disassembly Procedure . . . . . 55
Assembly Procedure . . . . . 55

**Troubleshooting . . . . . 59**
Introduction . . . . . 59
Troubleshooting and Repair. . . . . 59
Testing after Repair . . . . . 59

**Replacement Parts . . . . . 69**
See the Schematics / Parts section for a detailed view and print only parts list.

# Logic Changes

## General:

1. Dual Mode single band-800MHz AMPSand 800MHz CDMA. There are two models -(1)V. V2260 (II) Timeport T2260.
2. Dual band dual Mode- 800 MHz AMPS and 1900 MHz CDMA (PCS) There are two models-

V. 2267

Time port T2267

Competitively priced with the value added fictionalizing and feature set(s)

Microbrowser capable.

Full matrix 95x32 Pixel dot matrix display with hard icons.

Intergrated headset jack conveniently located on the top left side of the unit.

MT and MO SMS

Form factor proven through global research. Designed to be the most comfortable phone on the market

Smart button

Main Housings:

This product utilizes completely new front and rear housings, the housing utilizes new materials, finishes and textures which maximizes the feeling of comfort.

AAAL Battery door protects the batteries, but allow for the unit to fully function (charge, Tx and Rx) without the door in place. The door connects with the phone and be released with the push of a button.

Contact points on the back of the phone below the antenna for factory, and service testing, flexing, flashing etc.

A power port for the internal charger / CLA for all the models. This is located on the lower right


© 2000 Motorola, Inc.

side of the unit.

The integrated Headset Jack is located on the top left side of the unit.

All the rear housings accommodate the removable belt clip attachments.

## SHARK LOGIC CIRCUIT

The main chip sets of SHARK CDMA are the CASPER, CIA and CCAP-LITE.

The CASPER include the 32 bits 68338 MCU, which controls the whole part of the phone and the CSP, which processes the CDMA baseband digital signals and DSP, which performs the 8K / 13Kbps Q-CELP Vocoding function.

The CIA provides the analog CDMA signal interface and the Audio function.

CCAP-LITE provides the power management function of the phone.

The memory consist of 16Mbits of Flash(1M x 16) and 2Mbits SRAM

(128K x 16).

The logic parts have the watchdog, keypad, backlite, oscillator circuit

And display and charging circuit.

The charging circuit contains COVIC IC which is 8 pin. Aids in Kick

Start charging / overvoltage protection.

Display is a LCD 96 x 32 graphic matrix with additional icon COG and KS0717 Driver IC.

There is no butt plug, the communication to the phone takes place using special cable that plugs at the back of the phone, above the batteries, you have to remove the battery door to access these test points.

Shark uses 3 AAAL cells 1.2Volts.

There are two models in shark: Timeport and V.

## SHARK RF CIRCUIT

The RF circuit is very similar to CALIBER product, The Dual-Band

CDMA SHARK contains two completely separate receiver paths: an 800 MHz path that converts analog signals and a 1900 MHz path for the digital CDMA signal. The two paths have different RF, LO and IF frequencies.

In shark there is no accessory port for RF from the butt plug. To perform RX and TX test attach the special cable to the RF test point on the back side near the antenna, remove the groumet.

Frequency of operation and channel

1900 Mhz Receiver Band 1930 to 1990 Mhz

1900 Mhz Transmitter Band 1850 to 1910 Mhz

The maximum output power applied to the antenna is:

Analog: 24.5dBm

PCS CDMA: 23.5dBm

Shark uses the ME3C mixer-exciter IC rather than the MOON IC part.

The ME3C allows full control of the RF power range from –39 dBm to +11dBm without having to vary the ZIFSYN output power. The ME3 requires two LO's, one for PCS, the other for analog. The IF input pins are the same regardless of analog/PCS. There is one enable pin for the ME3C, one pin for analog/PCS mode, and one for AGC pin. The two separate RF mixer outputs are combined and drive to exciter. The ME3C PCS does require an interstage RF filter between the Mixer and the exciter, but AMPS mode doesn't require an interstage RF filter.

Shark uses DUAL BAND VCO Module for main LO, 14 pin part with two outputs one for AMPS and another for PCS, the control voltage from ZIFSYN IC varies from 0.5 V to 2.2 V, the VCC to the IC is supplied by the VSF 1900 and VSF 800. The output is split into RX_LO and TX_LO for both AMPS and PCS LO.

The rest of the RF circuit is similar to DUAL BAND Caliber product.

## CDMA –PCS 1900 Mhz BAND

**Performance specification:**

**General**

**Frequency and channel information:**

| Channel | Tx Frequency (Mhz) | Rx Frequency(Mhz) |
|---|---|---|
| 25 | 1851.25 | 1931.25 |
| 200 | 1860.00 | 1940.00 |
| 400 | 1870.00 | 1950.00 |
| 600 | 1880.00 | 1960.00 |
| 800 | 1890.00 | 1970.00 |
| 1000 | 1900.00 | 1980.00 |
| 1175 | 1908.50 | 1988.50 |

## CDMA 1900MHz Performance Specifications General

**Table 1:**

| *Function* | *Specification* |
|---|---|
| Frequency Range | 1850 to 1910 MHz(tx), 1930 to 1990(RX) |
| RF Channel Bandwidth | 1.25 MHz |
| Channels | 48 (Channels spaced at an increment of-25) |
| Duplex Spacing | 80 MHz |
| Frequency Stability | Center Frequency* + / - 8.5 $X10^{-8}$<br>+ / - 150 Hz of incoming RX CDMA signal. |
| Operation Voltage | +3.6 V nominal (3.0 -4.2 V DC) |
| RF Power output | 0.20 Watts - 23 dBm into 50 ohms (CDMA, nominal) |
| input/output impedance | 50 ohms(nominal) |
| Spurious /Harmonic emissions | Complies with title 47, Part 22 of the code of federal regulations. |
| Vocoders | 8kbps, 13kbps, EVRC |
| Transmit Time Error | +/- 1 US |
| Modulation Type | 1M25D1W(1.25MHz bandwidth), OQPSK, G7W(CDMA) |
| Transmit Duty Cycle | Variable- full, 1/2, 1/4, 1/8 rate(CDMA Mode) |
| CDMA Transmit Waveform Quality(rho) | 0.94 |
| Receive Sensitivity | -104dBm(CDMA, 0.5% Static FER, 8kbps Vocoder) |
| Display | 96 X 32 LCD |
| | |

## Specifications

### Overall System CDMA 800MHz

**Table 2:**

| *Function* | *Specification* |
|---|---|
| Frequency Range | 824.04 - 848.97 MHz Tx,<br>Channels 1 to 799, $f_{Tx} = 0.03 * N + 825$ MHz<br>Channels 990 to 1023, $f_{Tx} = 0.03(N—1023) + 825$ MHz<br>869.04 - 893.97 MHz Rx<br>Channels 1 to 799 is $f_{Rx} = 0.03 * N + 870$ MHz<br>Channels 990 to 1023, $f_{Rx} = 0.03(N—1023) + 870$ MHz |

**Table 2:**

| *Function* | *Specification* |
|---|---|
| Channel Spacing | 30 KHz |
| Channels | 832 |
| Duplex spacing | 45 MHz(amps) |
| Frequency Stability | +/- 2.5 ppm (Amps) |
| Operating Voltage | 3.6 - 4.8 VDC |
| Display | 96 X 32 LCD |
| RF Power Output | 0.6 watts - 28.0 dBM into 50 ohms (AMPS, nominal)<br>0.25 watts - 24.0 dBM into 50 ohms (CDMA, nominal) |
| Input/Output Impedance | 50 ohms (nominal) |
| Spurious / Harmonic Emissions | Complies with Title 47, Part 22 of the code of Federal Regulations. |
| Audio Distortion | Less than 5% at |
| Hum and Noise(C-MSG) | 32 dBm below +/- 8kHz deviation(transmit and receive) |
| Modulation | F3: + 12 kHz for 100% at 1 kHz, AMPS (wide)<br>1M25D1W (1.25 MHz bandwidth) CDMA |
| Transmit Audio Response | 6 dBm/octave pre-emphasis |
| Transmit Audio sensitivity | (AMPS)<br>+ 2.9 kHz deviation (nom.) @ 97 dBm SPL input @ 1 kHz |
| Transmit Duty Cycle | full, 1/2, 1/4, 1/8 rate (CDMA Mode) |
| CDMA Transmit Waveform Quality(Rho) | 0.94 |
| Receiver Sensitivity | -116 dBm (AMPS, SINAD, C-MSG weighted)<br>-104 dBm (CDMA, 0.5% Static FER) |
| Alternate Channel Desense Protection | -60 db@+/- 60kHz (Amps) |

**Table 3: Environmental**

| *Function* | *Specification* |
|---|---|
| Temperature Range | Operational -30 $_{o}$C to +60 $_{o}$C (-22 $_{o}$F to +140 $_{o}$F)<br>Storage -55 $_{o}$C to +85 $_{o}$C (-67 $_{o}$F to +185 $_{o}$F)<br>Thermal Shock -40 $_{o}$C to +85 $_{o}$C (-40 $_{o}$F to +185 $_{o}$F)<br>meets Mil. Std. 810C |
| Shock | Exceeds EIA Standards RS152B (Section 15) and IS-19 |

**Table 3: Environmental**

| *Function* | *Specification* |
|---|---|
| Drop | Exceeds EIA Standards RS316B and IS-19 |
| Humidity | 95% Relative Humidity; meets EIA Standard IS-19 |
| Vibration | Exceeds EIA Standards RS316B and IS-19 |
| Salt Fog | Salt Solution fog at 35 $^{o}$C (95 $^{o}$F), tested for 48 hours |
| Dust | 140 mesh blown silica flour test, tested for 5 hours |
| Notes: | • EIA (Electronic Industries Association) Standard RS152B states the minimum stan-dards for Land Mobile Communications, FM or PM transmitters 25-470 MHz.<br>• EIA IS-19 states the recommended standards for 800 MHz cellular subscriber units.<br>• EIA Standard RS316B states the standards for portable land mobile communications.<br>• U.S. Military Standard 810D establishes uniform environmental test methods for deter-mining the resistance of equipment to the effects of natural and induced environments peculiar to military operations.<br>• TIA / EIA / IS-98 Recommended Minimum Performance Standards for Dual-Mode Wide band Spread spectrum Cellular Mobile Stations. |

**Specifications subject to change without notice.**

## Foreword

### Scope of Manual

This manual is intended for use by experienced technicians familiar with similar types of equipment. It is intended primarily to support basic servicing, which consists primarily of mechanical repairs and circuit board replacement.

Authorized distributors may opt to receive additional training to become authorized to perform limited component repairs. Contact your regional Customer Support Manager for details.

### Model and Kit Identification

Motorola products are specifically identified by an overall model number on the product label. In most cases, assemblies and kits which make up the equipment also have kit numbers stamped on them.

## Replacement Parts Ordering

Motorola maintains a parts office staffed to process parts orders, identify part numbers, and otherwise assist in the maintenance and repair of Motorola Cellular products. Orders for all parts should be sent to the Motorola International Logistics Department at the following address:

Attn.: Global Spare Parts Department
Motorola Cellular Subscriber Group
2001 N, Division St.
Harvard, IL 60033-3674
U. S. A.
FAX: 1-815-884-8354

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

### Service

Motorola's regional Cellular Subscriber Service Centers offer some of the finest repair capabilities available to Motorola Subscriber equipment users. The Cellular Subscriber Service Centers are able to perform computerized adjustments and repair most defective transceivers and boards. Contact your regional Customer Service Manager for more information about Motorola's repair capabilities and policy for in-warranty and out-of-warranty repairs in your region.

### General Safety Information

**CAUTION**

**Do not jump start vehicle or use an automotive battery charger while the vehicle adapter option and the portable radiotelephone are connected to the vehicle electrical system, as this may cause serious damage to the radio. Disconnect the radio by removing the cable kit fuses.**

### Portable Operation

**DO NOT** hold the radio so that the antenna is very close to, or touching, exposed parts of the body, especially the face or eyes, while transmitting. The radio will perform best if it is held in the same manner as you would hold a telephone handset, with the antenna angled up and over your shoulder. Speak directly into the mouthpiece.

**DO NOT** operate the telephone in an airplane.

**DO NOT** allow children to play with any radio equipment containing a transmitter.

### Mobile Operation (Vehicle Adaptor)

As with other mobile radio transmitting equipment, users are advised that for satisfactory operation of the equipment and for the safety of personnel, it is recommended that no part of the human body shall be allowed to come within 20 centimeters of the antenna during operation of the equipment.

**DO NOT** operate this equipment near electrical blasting caps or in an explosive atmosphere. Mobile telephones are under certain conditions capable of interfering with blasting operations. When in the vicinity of construction work, look for and observe signs cautioning against mobile radio transmission. If transmission is prohibited, the cellular telephone **must be turned off** to prevent any transmission. *In standby mode, the mobile telephone will automatically transmit to acknowledge a call if it is not turned off.*

All equipment must be properly grounded according to installation instructions for safe operation.

# DESCRIPTION

**Table 4:**

| Note |
| --- |
| The following description is intended only as a preliminary general introduction to cellular systems. This description is greatly simplified and does not illustrate<br><br>the full operating capabilities, techniques, or technology involved in cellular systems. |

### Overall Concept

Cellular systems are used to provide radio-telephone

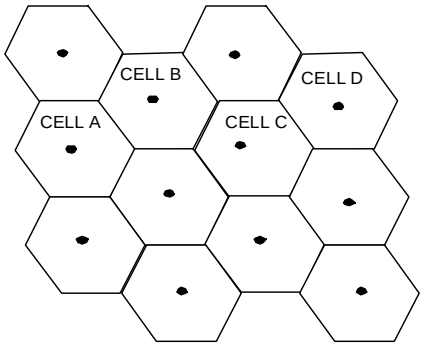
service in the frequency range of 824-894 MHz.

A cellular system provides higher call handling capacity and system availability than would be possible with conventional radio-telephone systems that require total system area coverage on every operating

channel. The cellular system divides the system coverage area into several adjoining sub-areas, or cells.

Each cell contains a base station (cell site) which provides transmitting and receiving facilities. CDMA is a “spread spectrum” technology, which means that it spreads the information contained in a particular signal of interest over a greater bandwidth than the original signal. With CDMA, unique digital codes, rather than separate RF frequencies or channels are

used to differentiate subscribers. The codes are shared by both the mobile station and base station and are called “pseudo-random code sequences”. Since CDMA is a spread




spectrum technology, all users share a range of the radio spectrum. CDMA cell coverage is dependent upon the way the network is designed. For each system 3 characteristics must be considered: coverage, quality, and capacity. These 3

must be balanced for desired lever of performance.

Some of the CDMA benefits are:

- Improved call quality with better and more consistent sound.
- Enhanced privacy.
- Variable rate vocoder.

**Figure 1: Hypothetical Cell System**

### Operation

In Figure 1: “Hypothetical Cell System”, the area bounded by bold lines represents the total coverage area of a cellular system. This area is divided into several cells, each

©2000 Motorola, Inc.

containing a cell site base station which interfaces radiotelephone subscribers to the switching system. Since there are no channels in CDMA, a user has a better chance of completing a call. Also, now there is no hard handoff between
cell sites since all sites operate on the same frequency. This is called soft handoffs. In this system, subscribers in cell A & D simultaneously operate in the same frequency. As a user moves from cell site to cell site, the base station monitors the signal strength of the user. Based on this signal strength, the base station decides which cell shall carry the call. When a radiotelephone is in use well within a cell, the signal strength received at the cell site base station will be high. As the phone is moved towards the edge of the cell, its received signal strength decreases. Signal strength information therefore provides an indication of the subscriber's distance from a cell's base station. This change is handled automatically, and is completely transparent to the user. For example, assume that a cellular tele-phone
initiates a call in cell A and then moves across the system area through cells B and C to cell D. As the phone moves into cell B, it is instructed to change to a different frequency that operates through the B cell
on that frequency. A similar change is performed when the phone moves from cell B to cell C and again
when the phone moves from cell C to cell D. In this example, the radiotelephone has operated in four cell sites, through four cell sites, and on the same spread spectrum without interruptions in voice communications. As the radiotelephone leaves a cell, the frequency on which the phone and base station were operating is made available to another subscriber in that cell. Since this radiotelephone is dual mode, the radiotelephone can operate in either a CDMA system or Analog system.

## Service Area

The area within which calls can be placed and received is defined by the system operator.
(Because this is a radio system, there is no exact boundary that can be drawn on a map.) If the portable is outside the radio service area, a No Svc (no service) message will appear on the phone's display, and calls cannot be placed or received. If this happens during a conversation, the call is lost. Places where the ability to place or receive calls would be lost are in totally enclosed areas, such as underground parking garages, in buildings without windows, and in elevators. This situation would be indicated either by the No Svc message illuminating, or by the sound of either a fast busy signal or a high-low siren signal when call placement is attempted. General usage in buildings having reason-able glass area is usually quite good. However, it may be necessary to move closer to a window to ensure reliable opera-tion.

## Theory of Operation

### AMPS

#### Reciever Circuitry

RF enters the phone via the internal antenna, A1. The received RF signal is routed through monoblock duplex filter FL13, and FL12. The RF signal is routed through additional gain and filtering stages,Q40, , FL40, and Q40. The received signal then enters the Mixer U120.

The local oscillator input to the Filter FL120 is a 978-1004 MHz VCO, U680 controlled by the IF/Synthesizer IC U700. The 109.65 MHz mixer output is routed through FL201 into the IFIC U700.

#### Transmitter Circuitry

The modulated TX Offset VCO signal is mixed with the 978-1004 MHz local oscillator signal in TX Mixer U600 to produce an 823-849 MHz transmit signal. This signal passes through filter FL600 and voltage control attenuator thru U600 which controls the TX output power. Then the TX signal is amplified by U430. The output passes through the mono-block duplex filter FL12 and FL13 to RF switch the internal antenna accessory connector.

### CDMA PCS

#### Reciever Circuitry

RF enters the phone via the internal antenna, A1. The received RF signal is routed through monoblock duplex filter FL13 and FL10. Then the RF signal is routed through a direct path through additional gain and filtering stages,Q20, FL20. The received signal then enters the Mixer Q100.

The local oscillator input to the mixer is double of 1019-1050 MHz VCO, U600 controlled by the IF/Synthesizer IC U700. The 109.8 MHz mixer output is routed through FL200 into the IFIC U700.

#### Transmitter Circuitry

The modulated TX Offset VCO signal is mixed with the 1019-1050 MHz local oscillator signal in TX Mixer U600 to produce an 1850-1910 MHz transmit signal. This signal passes through filter FL601. Then the TX signal is amplified by U832 and passes through Tx coupler. The output passes through the mono-block duplex filter FL10 to FL13 to the internal antenna.


© 2000 Motorola, Inc.

**Frequency Synthesizer Circuitry**

The phone contains three PLL frequency synthesizers in the IF/Synthesizer IC U700. One synthesizer controls the tunable 978-1004 MHz main local oscillator, U680 and the tunable 1019MHz - 1050MHz main local oscillator for PCS 1900 mode. The second synthesizer controls the TX offset oscillator (internal to U700) which operates at a fixed frequency of 309.3 MHz for AMPS, and 309.6 MHz for CDMA. The TX offset signal is divided by 2 before going to the TX mixer. TX modulation occurs in the TX offset synthesizer in AMPS mode. The third synthesizer (also internal to U700) operates at a fixed frequency of 219.3 MHz for AMPS, 219.8 MHz for CDMA. This oscillator is divided by 2 and used to mix the received first IF signal down to baseband. All synthesizers obtain their frequency reference from the 16.8 MHz reference oscillator, U325.

**Transmit Power Control Circuitry**

The power control signal controls voltage

controlled attenuator U600 which is the TX mixer. A detected sample of the TX output signal with a variable reference voltage. A closed loop adjusts the Power Control signal such that the sampled RF signal level matches the reference level. In AMPS mode, the RF power range is +8 dBm to +28 dBM. In CDMA mode the RF power range is -50 dBm to +24 dBm. In CDMA mode, the power control can operate in either open-loop or closed-loop modes. In open-loop mode, the power level is proportional to the received signal level. In closed loop mode, the power level is controlled by the CDMA cell, based on received signal strength at the cell site.

**Receive Audio - AMPS Mode**

AMPS discriminator audio is routed to U1900 to be digitized. All receive audio filtering and gain control is performed in the digital domain by DSP U1100. The processed RX

audio is converted back to analog by U1900

and amplified by the GCAP IC U2000. The

received audio is then routed to either the boom speaker or internal earpiece speaker.

**Receive Audio - CDMA Mode**

Received CDMA OQPSK data (RX I, RX Q) is gain controlled and converted to digital by U1900. The 1.2288 Mb/sec. RX data stream is then decoded by the U1100 Modem IC to produce a signal containing only the desired data. The digital speech data is routed

through the microprocessor U1100, decoded by the U1100 CELP Vocoder, and sent to U1900 to be converted into analog audio. The audio signal is then amplified by U2000 and sent to the earpiece speaker.

**Transmit Audio - AMPS Mode**

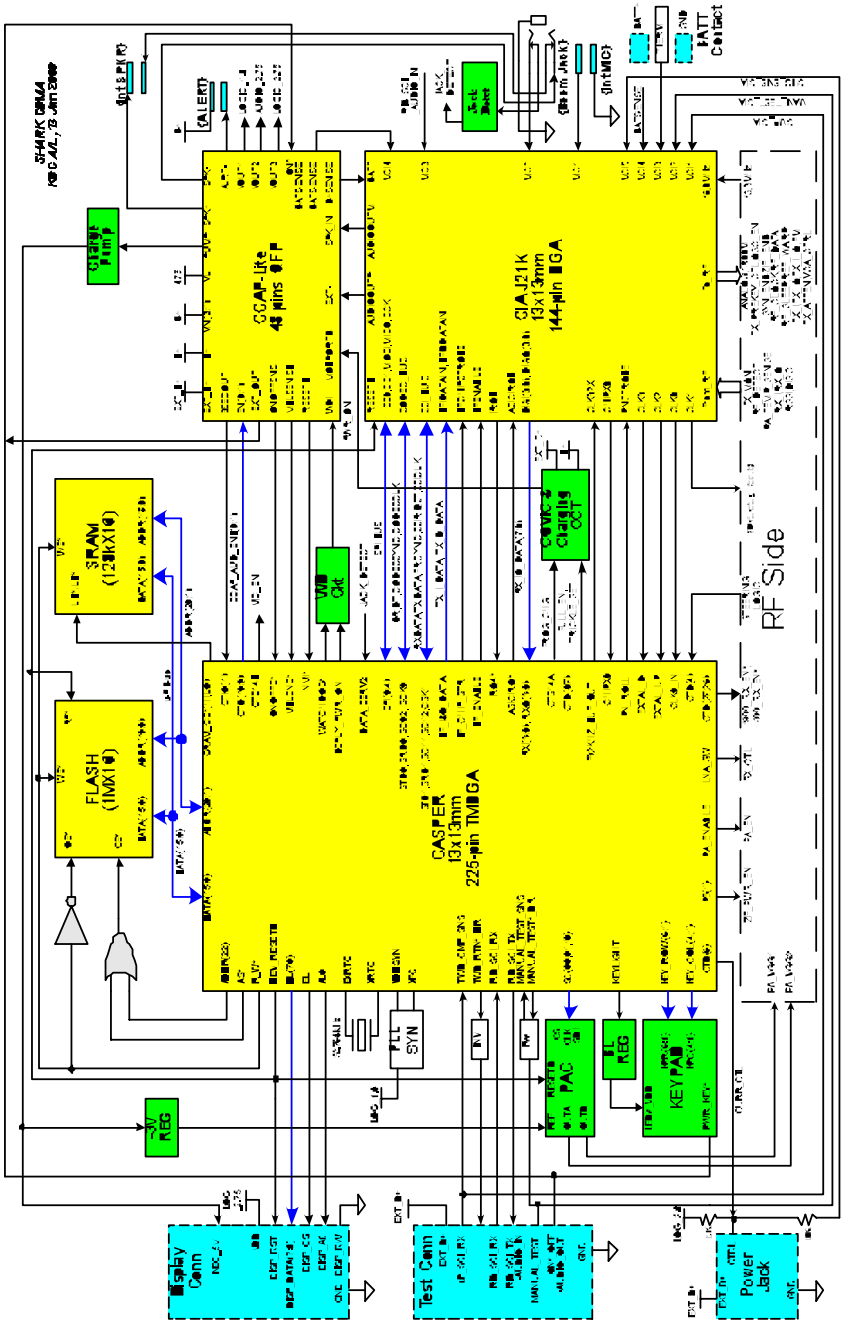
Audio from the internal microphone is ampli-fied

and converted to data by U1900. In AMPS mode, the digitized microphone audio is then sent to DSP U1100 which performs all compression, pre-emphasis, limiting, and band-pass filtering functions in the digital domain. All AMPS signalling (SAT, ST, DTMF) is also generated in the digital domain by DSP U1100. The digitized AMPS TX audio signal is converted back to analog by the U1900 and sent to the 154.65 MHz TX Offset VCO to modulate the transmitter.

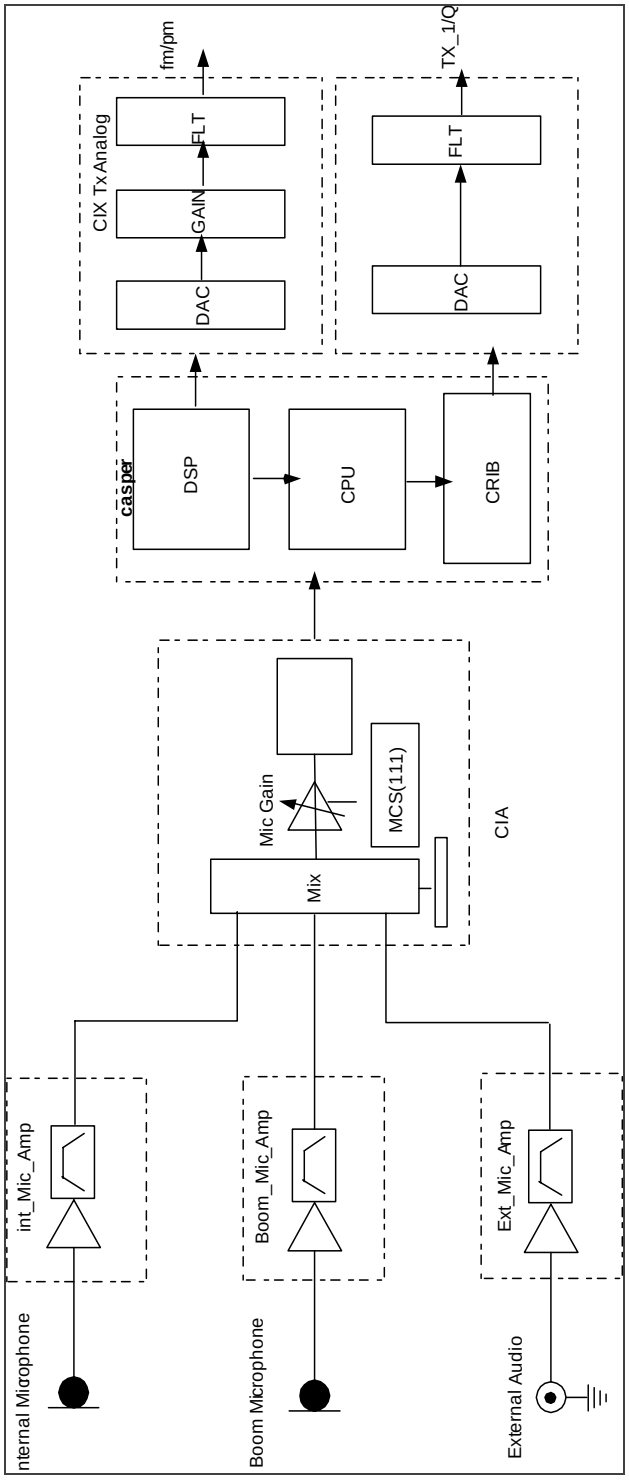
**Transmit Audio - CDMA Mode**

In CDMA mode, the digitized TX audio is processed by a CELP variable rate vocoder, U1100. The digital signal is then routed through microprocessor U1100 and processed by the CDMA Modem IC, U1100, which produces the 1.2288 Mb/sec. CDMA data
stream. This stream is then converted to analog OQPSK signals (TX I, TX Q) by D/A U1900. The TX I and TX Q signals are sent to the IF/Synthesizer IC U700 which modulates the 154.8 MHz TX offset VCO.

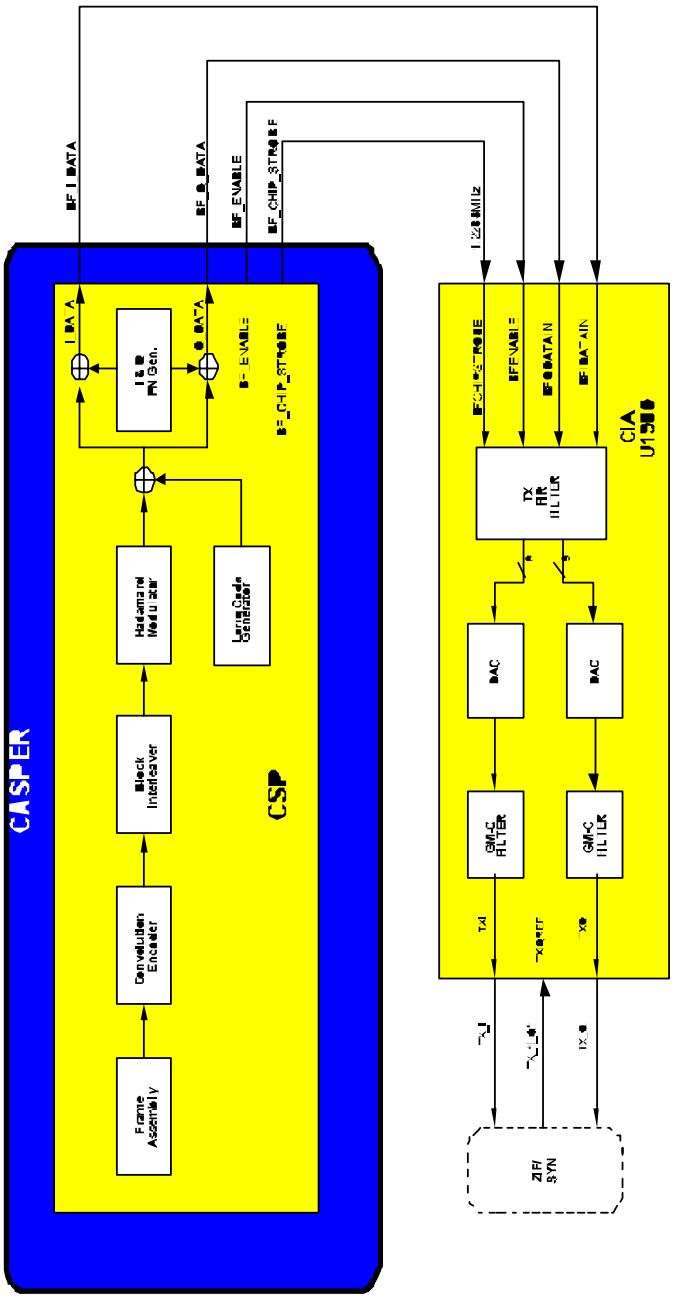
## AUDIO LOGIC BLOCK DIAGRAM:



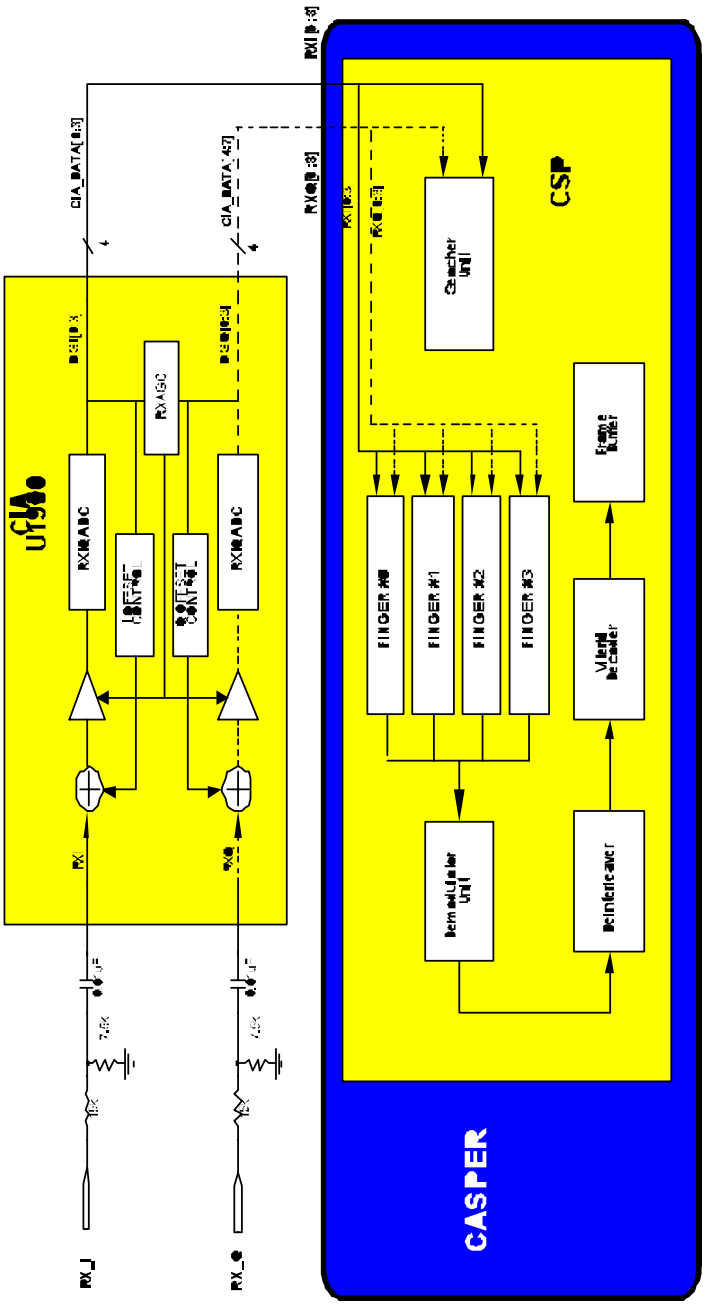
## Forward Audio Functionality:



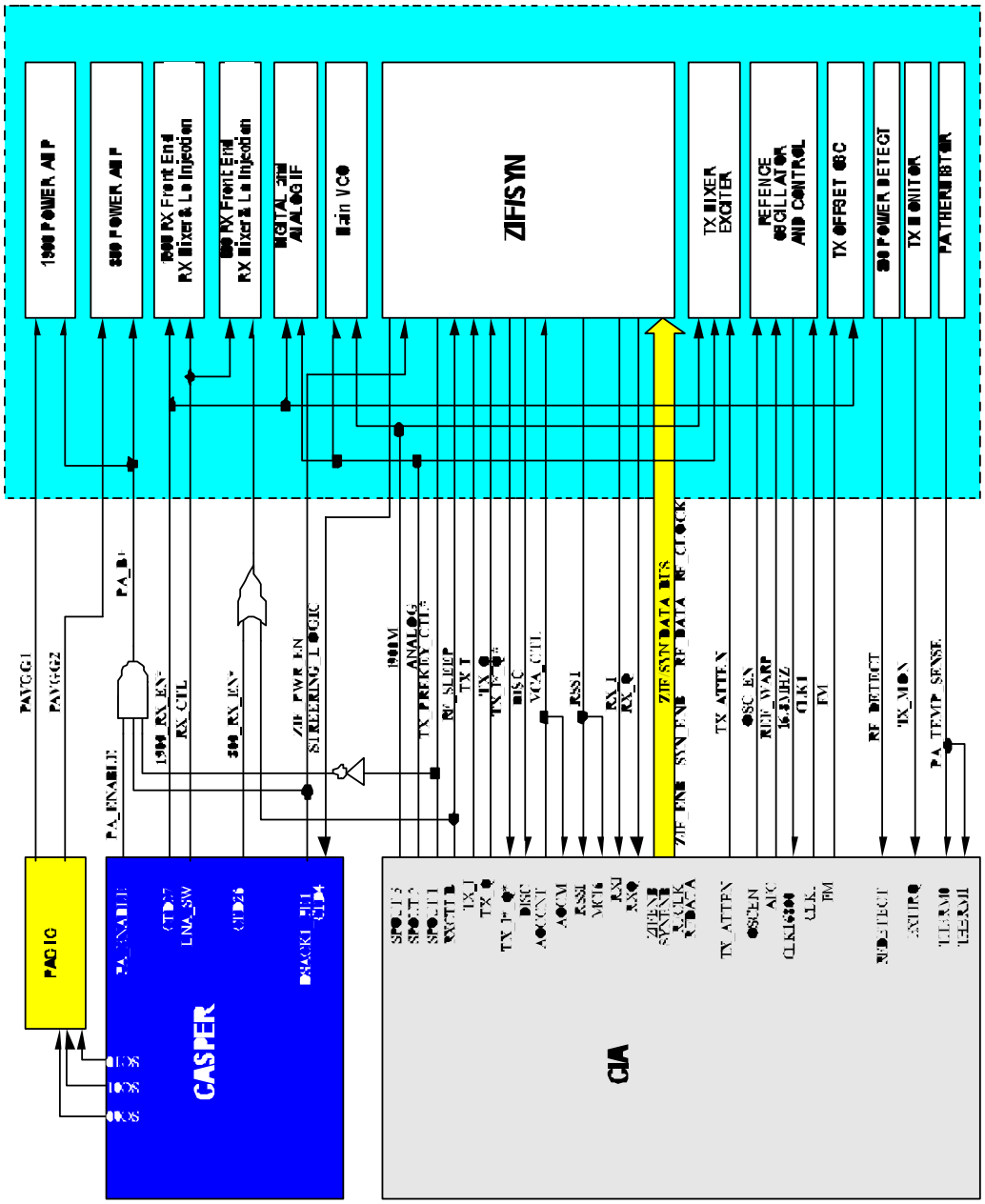
# Logic Circuitary Description:CDMA baseband Tx Path



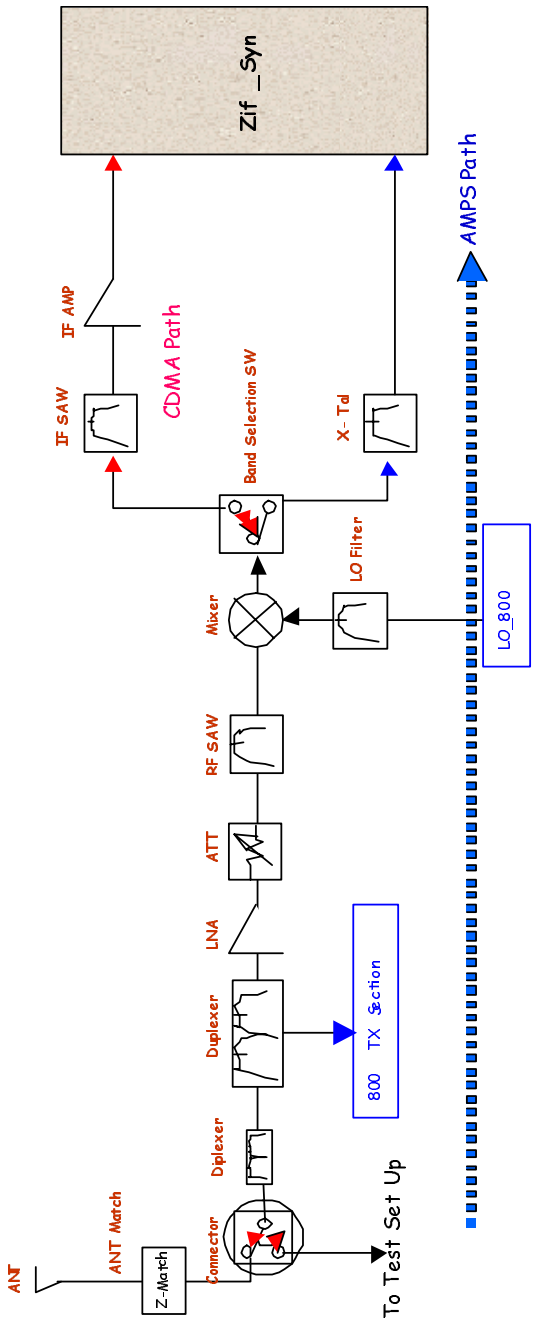
# CDMA Baseband Rx Path



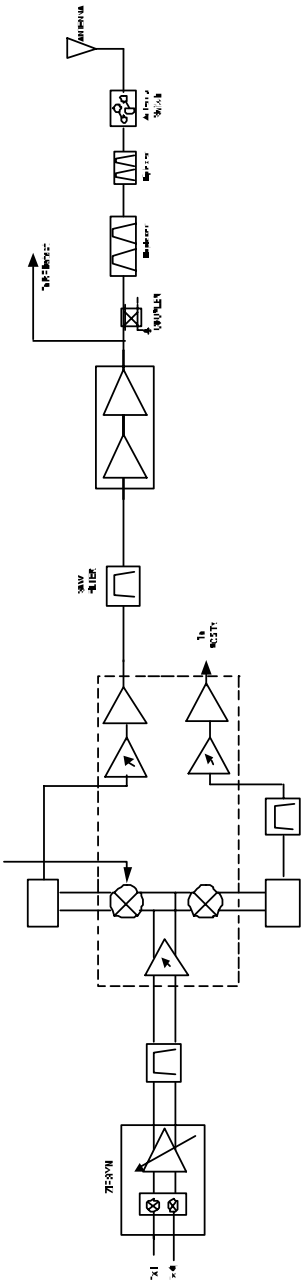
## RF Interface Diagram



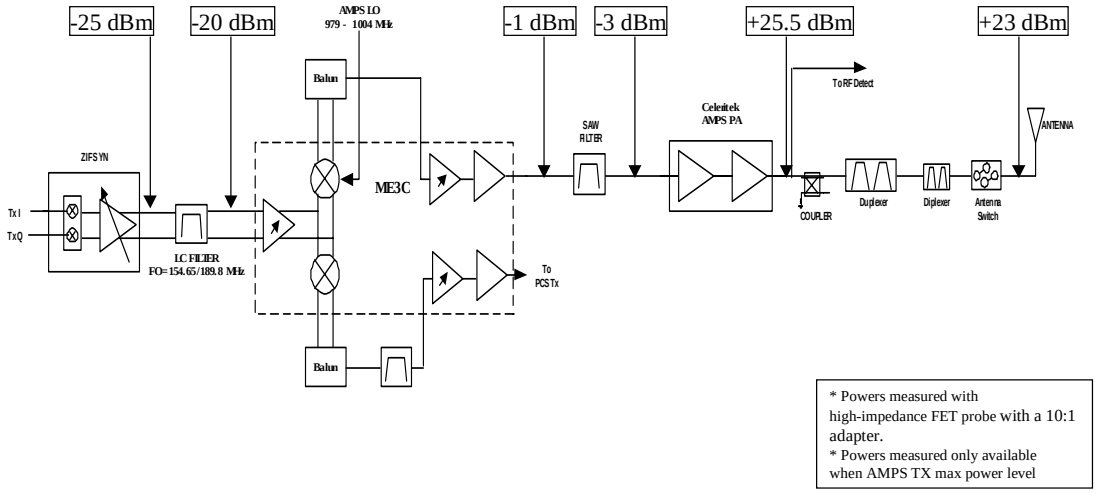
## AMPS Reciever Block Diagram



## Amps Transmitter Block Diagram



AMPS Transmitter Block Diagram




## AMPS Tx Troubleshoting Summary

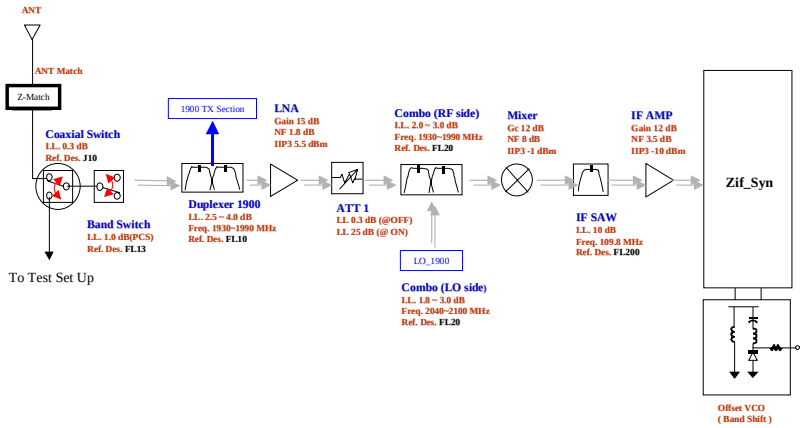
| Symptom | Probable Cause | Verification and Remedy |
|---|---|---|
| Low Transmit power respect to ideal power | a)Low TX IF Level | 1. Test command ( suspend + 570# + 05#)<br>2.ZipSyn VCA voltage should be 0.3 ~ 0.7V(max power)<br>3.IF level at C636 should be over -25dBm<br>4.Check the IF filter(FL602) soldering |
| | b)Low TX Local level | 1. The Local input level at ME3C pin24(L607) should be over -16dBm<br>2. Check the main VCO AMPS part and coupler soldering |
| | c) ME3C Supply Voltage problem | 1. ME3C IC 5, 9, 26. 27, 28, 32 should be load 2.75V. Check the ME 2.75V<br>2. ME3C pin 20 agc TXA voltage should be 1.0 ~ 1.5V<br>3. Check the ME3C exciter max output power, then power output at C600 should be over -1dBm |
| | d)Power Amplifier Problem | 1. After PA Final driver phasing, PA current should be in 169~181mA<br>2.PA pin 1,2 voltage should be in -0.4~-1.3 V<br>3.PA pin 5,6,7 voltage should be same with B+, or check Q430 and pin 1,2,4,5 and 6 voltage should be same with B+ and pin 4 voltage should be around 0V.<br>4. Check PA Gain and output. Remove CPL400 and check the max power out , the power out should be over 28dBm |

## Some Important Notes For PCS Reciever

The Dual-Band CDMA SHARK contains two completely separate receiver paths: an 800 MHz path that converts analog signals and a 1900 MHz path for the digital CDMA signal. The block diagram shows both these paths. The two paths have different RF, LO and IF frequencies. The most important, easily measurable figure of merit for each receiver is sensitivity, which expressed as the signal level at which the analog receiver sees 12 dB SINAD and the digital

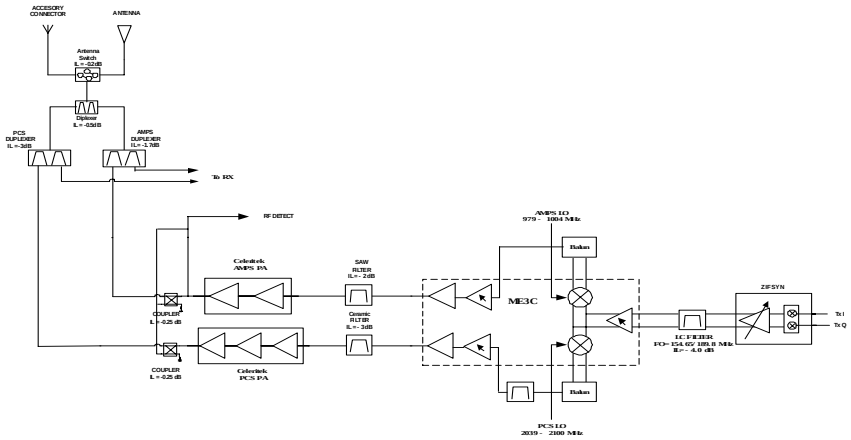
receiver experiences 0.5 % FER. (The specifications for these two levels are -116 dBm and -104 dBm, respectively) In this portion of the service notes, we will consider each stage in its schematic representation and will make some points about each block. DC levels and RF levels will be noted. In PCS Receiver line up presentation, RF levels noted in the Rx Sections are approximate based on -70 dBm input power in the Center of the Band (1960 MHz, CH600) at the mechanical switch and do not necessarily reflect the levels measured with high impedance probe. Frequency of operation and channelization 1900 MHz Receiver Band 1930 to 1990 MHz 1900 MHz Channelization 1-1200, Frequency = 0.05 * Channel# +1930

## Block Diagram of PCS Reciever

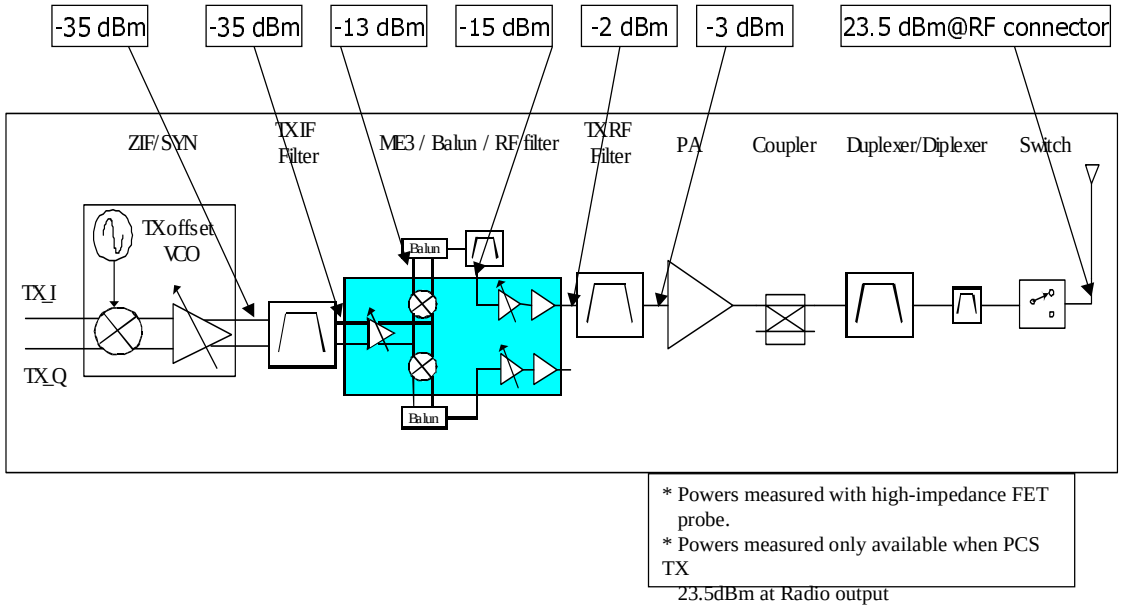



## Tx Block Diagram

The Shark Transmitter line-up is a little different with Caliber design, Shark used ME3 IC and doesn't use isolator and electrical RF switch. Unlike MANTA, this is done with two separate line-ups. The line-up splits in the ME3C, and recombines into the diplexer. The maximum output power supplied to the antenna is: Analog:24.5 dBm PCS CDMA:23.5 dBm



## PCS Transmitter Block Diagram



# Test & Adjustments

## Introduction

These phones allow keypad controlled cali-bration
(often referred to as “phasing”) of
various operating parameters, as follows:

- Transmit output power
- TX deviation (SAT, DATA, DTMF, microphone)
- RX discriminator output

These parameters are stored in memory on the Logic Board and affect the operation of the transceiver. All transceiver units and all replacement RF/AL boards are shipped from the factory with these adjustments already made. However, if components are replaced, checking and adjustment of the parameters may be necessary. Checking and adjusting parameters is also useful a troublshooting/
diagnostic tool to isolate defec-tive components.

The adjusting parameters accessible through keypad commands are a subset of the complete complement of adjustments, but are the key parameters necessary for basic opertion. Access to all adjustments requires a computer connected to the accessory connector (J3). In addition, the computer must be loaded with the proper diagnostic software.

Consult with Motorola regarding specific hardware and software requirements for the diagnostic computer.

## Test Interface

Figure 7: “Connections for Testing and Adjustments” on page 48 shows the audio and RF connections to a communications analyzer when using the MCEL 2000 or Zero Board test
interface, and test cable.
RF Cable adaptor :2887920K01
Ass’y cable SharkRadio,CDMA
DB25: AE20103172
Zero Board Ass’y with Legacy code SYN0223B

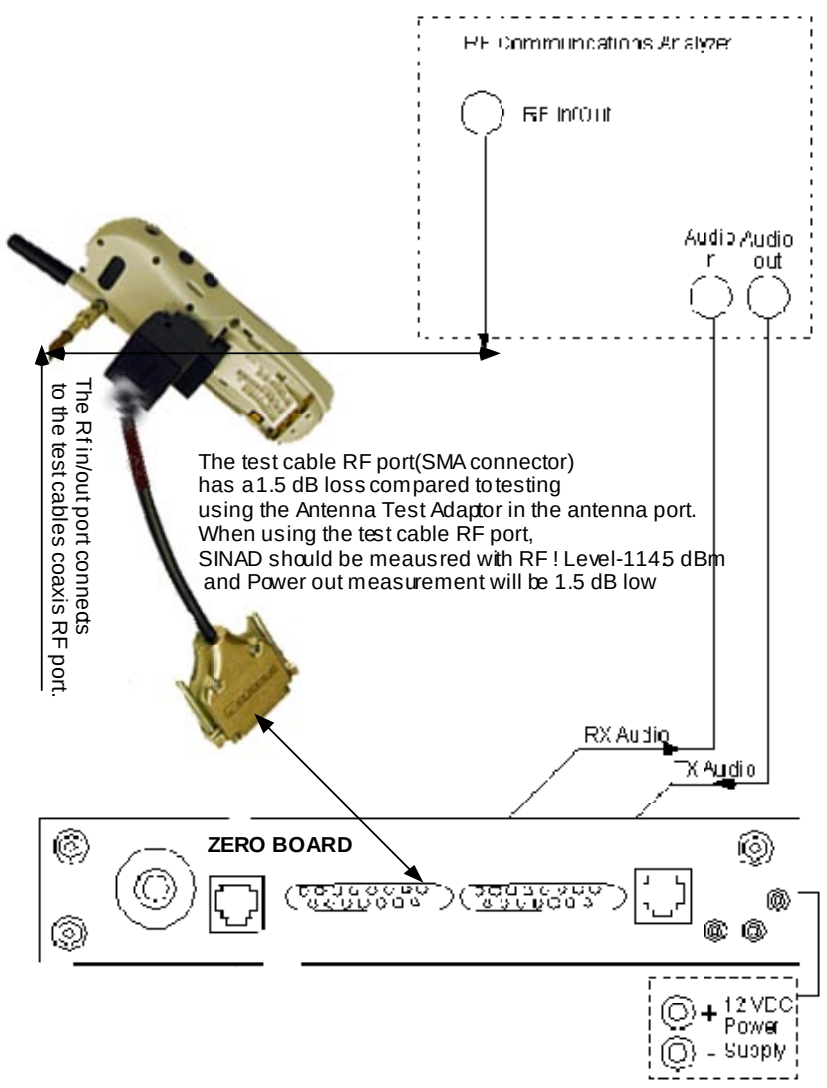
## Adjustments

To properly check and adjust the adjustment parameters using keypad commands, perform the following procedures in sequence.

**Impotrtant**

Only those memory locations referred to in the following procedure should be programmed. Data in other memory locations which are “Stepped through” during the procedure.


© 2000 Motorola, Inc.


RF Communications Analyzer
RF In/Out
Audio r
Audio out
The RF in/out port connects to the test cables coaxis RF port.
The test cable RF port(SMA connector) has a 1.5 dB loss compared to testing using the Antenna Test Adaptor in the antenna port. When using the test cable RF port, SINAD should be meausred with RF ! Level-114.5 dBm and Power out measurement will be 1.5 dB low
RX Audio
X Audio
ZERO BOARD
+ 12 VDC Power
- Supply

**Connections for Testing and Adjustments**

## Keypad Button Functions

Below is a description of the non-numeric keys used during the keypad calibration

procedure:

**Step 1.** Connect the test cable RF to a

servicing analyzer, using a coaxial cable.
Enter Manual Test Mode.
Depress the # button. The display should show the ’ prompt.
**Step 2.** Enter 11434# via the keypad to program the synthesizer for channel 434.
**Step 3.** Enter 05# to key the transmitter.

## TX Output Power Adjustment(Center of Band)

**Step 4.** Enter 73#. The portable display will show Step number “00” on the left and the corresponding hex value for the TX output power on the right.

**Table 5:**

| *Power Step* | *Output Power (at antenna port, +/- 0.5 dBm)* |
|---|---|
| 00 | 28dBm |
| 01 | 28dBm |
| 02 | 28dBm |
| 03 | 24dBm |
| 04 | 20dBm |
| 05 | 16dBm |
| 06 | 12dBm |
| 07 | 8dBm |
| 08 | Do not adjust |
| 09 | Do not adjust |
| 0A | Do not adjust |
| 0B | Do not adjust |

**Step 5.** Using the * button to advance through the power steps. Adjust each of the power steps listed in Table 6: “Output Power Levels” for the values shown as indicated on the servicing analyzer. Make adjustments as described in Step 6 and Step 7.

**Step 6.** Enter a 2-digit hexadecimal number via the keypad. This immediately updates the hex power level value, and the output power should change as indicated on the analyzer. If the new entry does not produce the desired analyzer reading (i.e. too high or too low),
a) depress the CLR button and enter another 2-digit number, or
b) use the VOL button to incrementally increase the hex value to obtain the desired reading on the analyzer. (The volume control may not be used to decrease the hex value.)

**Table 6:**

| *Note* |
|---|
| In order to enter hex digits A thru F, depress the **SND** button followed by:<br>0 hex A<br>1 hex B<br>2 hex C<br>3 hex D<br>4 hex E<br>5 hex F |

**Step 7.** With all necessary adjustments made and power Step “0B” showing in the display, depress * to enter all updated data and exit the 73# command.

## Maximum Deviation Adjust

**Table 7:**

| *Note* |
| --- |
| Before SAT, DTMF, data, or microphone deviations can be adjusted, the maximum deviation must be checked (and adjusted, if necessary). Proceed as follows. |

**Step 8**. Inject an unbalanced 1kHz 2.24V rms audio signal at J3 pin 8 (TX audio in). Connect the audio generator ground lead to J3 pin 6 (audio ground). The audio signal source must be low impedance (or the injection signal must be measured at pin 10 to ensure the proper level of 2.24 V rms).

**Step 9.** Enter the following commands:

**58#** to enable compandor
**10#** to unmute TX audio
**356#** to select external audio path
**11434#** to place the telephone on channel **434**

**Step 10.** Enter 72#. Step 04 will be displayed on the left side of the display. Use the * button to toggle down to Step 0B (left side of display).

**Step 11.** Read the peak deviation on the analyzer. If it is not in the range of 11 to 12 kHz (preferably closer to 12kHz). Use the volume control or enter numbers via the keypad (as explained in Step 6) to adjust the maximum deviation to fall within the 11 to 12 kHz range. (Make adjustments so that the deviation remains as close to 12 kHz as possible, without exceeding 12 kHz.).

**Step 12.** Depress the * key to exit the 72# command. The display should show the ’ prompt.

**Microphone Deviation Adjust**

**Step 13.** Adjust audio generator signal level at J3 pin 8 (TX audio in) to 90 mV rms (still at 1 kHz).

**Step 14.** Enter 11434# to place the portable on channel 434. Enter 356# to select the external handset audio path.

**Step 15.** Read the average deviation on the analyzer. If reading is 2.05 kHz + 7% (corresponds to 2.9 kHz peak), proceed to Step 28. If it is not, enter 72#, use the * button to toggle down to Step 05 (left side of display), and use the volume control or enter numbers via the keypad (as explained in Step 6) to adjust for a microphone deviation of 2.05 kHz + 7%. After adjustment, note the hex value for Step 05 and exit the 72# command by repeatedly depressing the * button until the display shows the ’ prompt.

**Step 16.** Enter 72#, use the * button to toggle down to Step 06 (left side of display), and enter the Step 05 hex value noted in Step 26. Exit the 72# command by repeatedly depressing the * button until the display shows the ’ prompt. Remove the injection audio signal.

## DTMF Adjust

**Step 17.** Enter the following commands:
09# to mute TX audio
59# to turn off compandor
473# to set receive audio volume to level 3 (disables DTMF boost)
335# to turn on DTMF tone “5”

**Step 18.** Read the peak deviation on the communications analyzer. If

reading is 9.0 rad + 10%, proceed to Step 30. If it is not, enter 72#, use the * button to toggle down to Step 07 (left side of display), and use the volume control or enter numbers via the keypad (as explained in Step 6) to adjust for a deviation of9.0 rad + 10%. After adjustment, exit the 72# command by repeatedly depressing the * button until the display shows the ’ prompt.

**Step 19.** Enter 34# to turn off the DTMF tone.

### SAT Deviation Adjust

**Step 20.** Enter 251# to enable a 6000 Hz SAT tone.

**Step 21.** Read the average deviation on the communications analyzer. If the reading is 1.4 kHz + 10% (corresponds to 2.0 kHz peak), proceed to Step 33. If it is not, enter 72#, use the * button to toggle down to Step 09 (left side of display), and use the volume control or enter numbers via the keypad (as explained in Step 6) to adjust for a deviation of 1.4 kHz + 10%. After adjustment, exit the 72# command by repeatedly depressing the * button until the display shows the ’ prompt.

**Step 22.** Enter 26# to turn off the 6000 Hz SAT tone.

### Data Deviation Adjust

**Step 23**. Enter 14# to turn on the 10 kHz signaling tone.

**Step 24.** Read the average deviation on the communications analyzer. If the reading is 5.7 kHz + 10% (corresponds to 8.0 kHz peak), proceed to Step 36.
If it is not, enter 72#, use the * button to toggle down to Step 08 (left side of display), and use the volume control or enter numbers via the keypad (as explained in Step 6) to adjust for a deviation of 5.7kHz + 10%. After adjustment, exit the 72# command by repeatedly depressing the * button until the display shows the ’ prompt.

**Step 25.** Enter 15# to turn off the 10 kHz signaling tone.RX Discriminator Adjust
Step 26. Inject a -50 dBm, 883.020 MHz

**RX Discriminator Adjust**
Step 26. Inject a -50 dBm, 883.020 MHz (channel 434) signal FM modulated with a 1 kHz tone at + 2.9 kHz deviation into the antenna port, using an SLN8576A antenna test adaptor.

**Step 27.** Enter the following commands: 08# to unmute the RX audio 474# to set the receive audio volume to level 4356# to select the external handset audio path
Step 28. Enter 72#, use the * button to toggle down to step 0A (left side of display), and use the volume control or enter numbers via the keypad (as explained in Step 6) to obtain 100 mV rms +15% at pin 7 of J3 (RX audio out). After adjustment, exit the 72# command by repeatedly depressing the * button until the display shows the ’ prompt.

**Step 29.** Exit Manual Test Mode by depressing the PWR button. This completes the keypad adjustment procedure.

### AMPS Call Processing

The transceiver is connected to an RF Communications Test System capable of AMPS and CDMA base station simulation and the test simulation and the test described below are performed. The external antenna

on a Portable is RF coupled to the Test System. The phone is powered by a battery. All of these tests are performed on a pass/fail basis except where otherwise specified.

The following AMPS Call Processing tests must be done in a single test sequence.

**Step 1.** Initialize: Set the RF Communication Test System to provide an AMPS control channel at -50 dBm on channel 334.

**Step 2**. AMPS Registration: Turn the mobile transceiver on and force an AMPS Registration.

**Step 3.** AMPS Page: Page the mobile transceiver.

When the transceiver alert rings, answer the call using the FLIP for a Portable, the SEND key for a Mortable. Verify that the mobile has transferred to the traffic channel and is transponding SAT.

**Step 4.** AMPS Handoff: Initiate a handoff to another AMPS traffic channel. Verify that the mobile has handed off to the new traffic channel and is transponding SAT. Terminate the call using the FLIP for a Portable, the END key for a Mortable. Verify that the mobile has terminated the all and de-keyed the transmitter.

### CDMA Call Processing

The following CDMA Call Processing test must be done in a single test sequence.

**Step 1.** Initialize: Configure the test system to the following set parameters:
a. A CDMA pilot on channel 777 with sector A power at -70 dBm and sector B power at -80 dBm.

b. An AMP traffic channel with a 6 kHz tone modulated at 2 kHz of deviation.

c. A CDMA traffic channel handoff message set to the corresponding AMPS traffic channel frequency with SATcolor code 1 and power attenuation code 3.
d. A CDMA System Parameters Message with the following threshold data: Pilot detection threshold
(T_Add) = 28 Pilot drop threshold (T_Drop) = 32
Comparison threshold (T_Comp) = 5
Drop timer value (T_Tdrop) = 3

**Step 2.** CDMA Slotted Mode Page: Turn the mobile transceiver on and force a CDMA Registration. Page the mobile with a Service Option 1 call. Verify that the mobile establishes and maintains a CDMA call by measuring Rho.

**Step 3.** CDMA Softer Handoff: Set sector B power to -75 dBm.
The mobile must report sector B as included in the Candidate set. Increase sector B power to -65 dBm. The mobile must report sector B to be added to the Active set. Initiate a softer handoff and decrease sector B power to -80 dbm. The mobile must report sector B to be dropped from the Active set.

**Step 4.** CDMA Hard Handoff: Perform a CDM Hard handoff theo channel 691 while still in a Service Option 1 call.
Verify that the mobile hands off and maintains the call by measuring Rho.

**Step 5.** CDMA to AMPS Handoff: To perform a CDMA to AMPS handoff, send the CDMA traffic channel handoff message to the mobile transceiver and activate the AMPS traffic channel. Verify that the mobile

hands off to the AMPS traffic channel and is transponding SAT.

**Step 6**. Exit.

## Test Mode / Test Menu

### Introduction

Manual Test Mode software allows service personnel to monitor the telephone status on the display, and manually control tele-phone functions via the keypad.
Manual Test Mode operates at two levels: - Status Display Level, which allows the phone to operate normally while providing status indications in the display. Servicing Level, which disables normal call-processing and allows commands to be entered through the keypad to manually control operation of the phone.

### Status Display Level

Status Display Level is the power-up state in Manual Test Mode. Manual Test Mode is entered by momentarily shorting the MAN-UAL test pin(j3006) of the TEST POINT-connector J3 to ground, while turning the phone on. See Figure 7: “Connections for Testing and Adjustments” on page 48 In this level of Manual Test Mode the phone will place and receive calls as normal, but the dis-play shows status information. The first line of data indicates channel number, RSSI value, and call-processing mode. The second line of data indicates SAT frequency, carrier state, signaling tone state, power level, voice/data channel mode, Rx audio state, and Tx audio state. The format and explanation of this status information is given in Table 1 under “02# Radio Status Request.” When dialing a phone number, the status display ceases when the first digit of the phone number is entered. The telephone number is displayed in the normal manner as entered. When the Snd button (or End or Clr) is pressed, the status information display resumes.

### Servicing Level

The servicing level allows service personnel to manually control operation of a phone by entering test commands through the tele-phone keypad. Parameters such as oper-ating channel, output power level, mut-ing, and data transmission can all be selected by entering the corresponding commands. To enter the Servicing Level, press the # button while in Status Display level (power-up state of Manual Test Mode). In the Servicing Level, automatic call processing functions are disabled, and the phone is instead con-trolled manually by keypad commands. Table 2: “Test Commands For Manual Test Mode” on page 14 shows the test commands and the corresponding results.

**NOTE**

**There is no Status Display when the phone is in CDMA mode.**

### CDMA Specific Features

#### Test Menu

A Test Menu allows a user to initiate Markov calls, place Service Option 2 calls and set Software Configuration Options. The Test


© 2000 Motorola, Inc.

Menu is intended to provide a simple mechanism to perform various test and S/W debugging functions. Items will be added to and deleted from the menu period-ically. When Test Menu is enabled, it is entered by pressing the FCN key twice. Refer to Step “09” on page 27 for information on how to enable/ disable the Test Menu during NAM programming. Almost every Test Menu command accepts a parameter or data in the scratchpad. The procedure for transferring the scratchpad data and executing the Test Menu command is as follows:

Step 1. Decide which Test Menu command is going to be executed.

Step 2. Enter the necessary user input into the scratchpad.

Step 3. Press the FCN key twice to acti-vate the Test Menu.

Step 4. Press the volume keys until the desired Test Menu command is indicated on the display.

Step 5. Press the SND key to activate the command.

While the Test Menu is displayed, any keypress that is not volume or SND will also cause the menu to be exited without executing the current option. The Test Menu will also be exited whenever an incoming call is detected.

**Markov Calls**

During a Markov call, the “(G)ood” rate will be on the top line, and the “(T)otal” on the bottom line of the display. The display will cycle through all rates: (F)ull, (1/2) Half, (1/4) Quarter, and (1/8) Eight.

- Mobile originated Markov calls are performed by entering a telephone number and selecting a Test Menu option. Refer to the “Test Menu” section for further information.

- Mobile terminated Markov calls (Land to Mobile) are currently NOT supported. Pressing the SND key initiates a Markov call with the number in the scratchpad. If scratchpad is empty, “1234567” is used. This feature has no value in AMPS mode.

**Service Option 2**

For Service Option 2 calls, the In Use indi-cator will come on, but the display will remain blank.

- - Mobile originated Service Option 2 calls are performed by entering a telephone number and selecting a Test Menu option. Refer to the “Test Menu” section for further information.
- - Mobile terminated Service Option 2 calls will be automatically answered. Pressing the SND key initiates a Service Option 2 call with the number in the scratchpad. This feature has no value in AMPS mode.

**SW (Software) DIP**

Pressing the SND key initiates a one or more SW DIP functions based on the number in the scratchpad. Possible SW DIP functions are:

1: Disables closed loop power control.

4: Forces vocoder to provide full rate voice (may be enabled at any time during a call).

128: Sets the conversation audio path to “audio out” and “audio in” on the external connector.

For example, to disable closed loop power control, the user enters the following key sequence:

1 + FCN + FCN + ^ + SND

Undo all SW DIP settings (default at power on) by pressing:

0 + FCN + FCN + ^ + SND

These may be combined to do more than one at a time. For example, 4 and 1 may be combined by entering 5 before entering menu and selecting SW DIP.

## Test Mode

Also included in the software is a Manual Test Mode, which allows viewing the ESN, software version number, and programming the phone number (NAM).

To enter Manual Test Mode:

- 0 0 * * 83786633

(83786633 spells “TESTMODE” on the keypad).

## Handset Commands

**Table 8:**

| *Key* | *Function* |
|---|---|
| * | Toggles the display to the next location (enters data displayed to buffer). When hit at last program step, the command is terminated (if required, information may also be programmed into the EEPROM). If the command relates to a test function with multiple data displays, the * key is used to pause scanning data or to step through sequential test func-tions. Entering the * key during a pause time resumes scanning. |
| CLR/END | Resets the location to presently programmed information (if the command allows user input). |
| # | Terminates command without changing any of the programmed informa-tion. Each command consists of at least two digits entered from the telephone keypad with the entry terminated using the # key. For commands that initiate an action that requires a response or that accu-mulates error counts, the # key terminates the test. |
| DIGIT | Enter digit value. If the value to be modified is filled or exceeded, the **CLR** must be pressed before more digit selections are allowed. This is valid only if the command allows user input. |
| | |
| SND | Send into HEX mode. Keys 0-5 enter immediately after the send key are translated into HEX A-F respectively. **For The Gain and power Phasing handset test commands only** |
| Volume up/ down | Increments/decrements the current data value. If the maximum value for this data location is exceeded then it is set to zero. |
| STO | Shortcut to save values and quit test command. |
| | |

This will cause the phone to enter the Test

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| # | Suspend | | Terminate normal mode and enter Test Command Mode. This command is valid only when in normal mode. The # key must be held for 2 seconds to suspend with handset. Performs initialization as in the INIT test command. |
| 01# | Restart | | Equivalent to turning power off, then on again. |
| 02# | Radio Start Request | AAAZBBBC-DEFGHI | Display the current radio status:<br>**Handset Display Format:**<br>AAA = Current channel<br>(1000-1023 represented as A00-A23)<br>Z = Blank - AMPS<br>**Analog Mode:**<br>BBB = RSSI reading (averaged) for this channel.<br>C = Digital Color Code (data channel) 0-3 DCC, 4 invalid<br>= SAT Frequency (voice channel)<br>0=5970 Hz; 1=6000 Hz; 2=6030 Hz;<br>3=No SAT Lock<br>D = Carrier (0=OFF, 1=ON)<br>E = Word sync status (data channel) and Signalling tone (voice channel)<br>(0=OFF, 1=sync acquired/ON)<br>F = RF Power Level (Steps 0-7)<br>G = Reception Mode<br>(0=voice channel, 1=data channel)<br>H = Receive Audio (0=enabled, 1=muted)<br>I = Transmit Audio (0=enabled, 1=muted)<br>**CDMA Mode: (Not currently supported)**<br>**Bit fields undefined** |
| 03# | (not used) | | |
| 04# | Initialize Trans-ceiver | | Initialize the current radio as follows:<br>1. Carrier = OFF<br>2. RF power attenuation set to level 2<br>3. Signaling Tone = OFF<br>4. SAT transponding = OFF<br>5. Audio Path = TO INTERNAL SPEAKER<br>6. DTMF & Audio Tones = OFF<br>7. Receive Audio & Transmit Audio = MUTED<br>8. AMPS Mode<br>If the radio is a CDMA only model (not dual mode), it will default to CDMA mode instead. |
| 05# | Carrier on | | Turn on the carrier.<br>**05#** turns the carrier on with a nominal value for the DAC for an output power level. |
| 06# | Carrier Off | | Turn off the carrier. |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| | | | |
| | | | |
| 07# | RXMUTE | | Mute Recieve Audio |
| 08# | RXUNMUTE | | Unmute recieve audio |
| 09# | TXMUTE | | Mute Transmit audio. |
| 10# | TXUNMUTE | | Unmute transmit audio |
| 11X# | Loadsynth | | Load the specified channel into the radio synthesizer.<br>X-Enter up to 4-digits for the channel number. Channel numbers must be in the range of 1 to 1024.<br>Narrow mode channel numbers not currently supported. |
| 12X# | Set-Attn | | In AMPS mode: Set the AMPS RF power attenuation to the value specified (0-7). |
| Note: Use the PATH command (**35A#**) to select the audio path to test before using commands **07#** through **10#**. (Default path is to internal speaker and microphone). | | | |
| 14# | STON | | Enables continuous signalling tone. |
| 15# | STOFF | | Disables signalling tone. |
| 16#-18# | (Not Used) | | |
| 19# | Version | | Displays version corresponding to the two digit option x.<br>The following table show the valid options for x:<br>Decimal<br>00 Call processor<br>01 CDMA test command document number<br>02 Date<br>03 Time<br>22 DSP mask version<br>23 DSP patch version<br>- The call processor (factory version) number in the format: 00 XXXX<br>- The CDMA test command document number: 01 XXXX<br>- The date the build was created in the format: 01JAN96<br>- The time the build was created in the format: xxyyzz where xx is the hour, yy is the minute, and zz is the second.<br>- The version of the DSP mask xxxxyyyyyyzzzz where xxxx is the version, yyyyyy is the date, and zzzz is the device.<br>- The version of the DSP patch xxxxyyyyyyzzzz where xxxx is the version, yyyyyyis the date, and zzzz is the device.<br>All data fields can be viewed by hitting the * key repeatedly.<br>To exit hit the # key. |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 19X | Multi-Version | | Displays version corresponding to the two digit option x.<br>The following table show the valid options for x:<br>Decimal<br>00 Call processor<br>01 CDMA test command document number<br>02 Date<br>03 Time<br>22 DSP mask version<br>23 DSP patch version<br>- The call processor (factory version) number in the format: 00 XXXX<br>- The CDMA test command document number: 01 XXXX<br>- The date the build was created in the format: 01JAN96<br>- The time the build was created in the format: xxyyzz where xx is the hour, yy is the minute, and zz is the second.<br>- The version of the DSP mask xxxxyyyyyyzzzz where xxxx is the version, yyyyyy is the date, and zzzz is the device. |
| 20#-24# | (not -used) | | |
| 25X# | Sat/Dsat On | | Enable SAT/DSAT transponding.<br>For AMPS mode, the bye following the opcode is the color code of the SAT frequency that the radio may expect to receive. The command only uses the narrow phase lock loop mode and locks only to the frequency selected (+/- 15 Hz).<br>Valid color codes for X:<br>0 = 5970 Hz<br>1 = 6000 Hz<br>2 = 6030 Hz |
| 26# | Sat/Dsat Off | | Disable the transponding of Sat/Dsat. |
| 27X# | Cdata | | AMPS: Continuous Transmit Data on the reverse Analog Control Channel.<br>CDMA: Random Transmit Data (RTD) on the reverse CDMA channel.<br>Input Action<br>0 Start (AMPS) / Variable Rate (CDMA)<br>1 Full Rate (CDMA)<br>2 Half Rate (CDMA)<br>4 Quarter Rate (CDMA)<br>8 Eighth Rate (CDMA)<br>9 Stop RTD (AMPS, CDMA) |
| 28# | HITNON | | Tuen on high tone (frequency 1150 Hz +/- 55Hz) |
| 29# | HITNOFF | | Turn off high tone. |
| 30# | LOTNON | | Turn on low tone (frequency 770 Hz +/- 40 Hz) |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 31# | LOTONFF | | Turn off low tone. |
| 32# | INVM | | Initialize non-volatile memory to all zeros. This command should be reserved for special situations where reprogram-ming will be required (such as memory chip or circuit board replacement or when a radiotelephone is to be reissued to a new subscriber).<br>This command may take a minute or more to complete; during which time the number 32 will be displayed. DO NOT turn off the radiotelephone until the normal servicing level display resumes. |
| 33X# | DTMFON | | Generates a continuous DTMF tone as specified by input X.<br>Input X may be 0-9 for keypad DTMF, 10-18 for single low or high tone, and 20-25 for tripled low or high tone. |
| 34# | DTMFOFF | | Turn off DTMF tones. |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 35X# | Path | | Change the audio path to A, where A =:<br>0 = Hands free (selects input signal AUDIO IN @ J3-pin 8 and outputs audio signal AUDIO OUT/ON-OFF @ J3-pin 7; internal speaker and microphone are muted.)<br>1 = Speaker (normal audio path; selects internal mic and outputs audio @ AUDIO OUT/ON-OFF @ J3-pin 7; internal speaker is muted.)<br>2 = Alert (activates the alert transducer for as long as the # key is pressed. To prevent overstressing the alert transducer., DO NOT hold the # key down for extended periods.)<br>3 = Handset (selects the internal mic and speaker.)<br>4 = Mute (all audio paths and supplies are off, DSP put to sleep.) This command must be followed by a different AUDIO-PATH command (not MUTE) in order to guar-antee proper DSP functionality. Failure to do so may result in a radio failure.<br>5 = Internal MIC Test (routes the internal mic audio directly to AUDIO OUT/ON-OFF @ J3-pin 7, and routes audio input at AUDIO IN @ J3-pin 8 directly to the earpiece speaker.)<br>6 = External Handset (selects input audio at AUDIO IN @ J3-pin 8, and outputs audio at AUDIO OUT/ON-OFF @ J3-pin 7; internal speaker and mic are muted, and sidetone is turned on.)<br>7 = Reserved (not supported)<br>8 = Reserved (not supported)<br>9 = Boom MIC (selects input audio at AUDIO IN and outputs audio at AUDIO OUT/ON-OFF to headset connector; internal speaker and mic are muted, and sidetone is turned on.)<br>This command enables all internal and external hardware controls necessary to route audio to/from the correct outputs/inputs. |
| 36# | (not used) | | |
| 37# | (not used) | | |
| 38# | SND-SN | AABB | Returns serial number contents.<br>If all bytes = 00, no serial number is programmed.<br>Display four byte serial number in hexadecimal one byte at a time, along with a byte count. The * key causes the next byte/count to be displayed. |
| 39#-44# | (not used) | | |
| 45# | READRSSI | | Returns the RSSI reading taken on the current channel. The number is displayed as a three digit decimel number. |
| 46# | (not used) | | |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 47X# | set-aud | | Sets the audio level to the value specified by X.<br>Audio level X is represented as 0 = lowest, 15 = loudest.<br>Range of 8-15 has DTMF Feedback boost bit enabled. |
| 48# | SIDETN | | Enable sidetone.<br>(Command **05#** must also be executed). |
| 49# | SIDETF | | Disable sidetone.<br>(Command 06# must also be executed) |
| 50# -54# | not used | | |
| 55# | Prog-nam | nam | Programs the NAM through the handset.<br>This version uses supports only currently required NAM fields and it supports programming of data logger bytes. At the last step, the user enters a 1 to begin programming the data logger bytes.<br>Handset key entry is defined in Table 1: “Handset Command Key Entry” on page 13.<br>Refer to “NAM Programming” on page 25 of this manual for programming details. |
| 56# | Auto-Cycle | | Puts the radio in autocycle mode (CDMA only). Exit this command with the # key.<br>This command causes the radio to infinitely loop between 2 cycles. One cycle is the display/transmit and the other is standby. The display/transmit cycle has a duration of 90 seconds and the radio has the following setup:<br>- Display has all 8’s showing.<br>- Turn on variable rate random transmit data.<br>- Carrier is enabled.<br>The standby cycle has a duration of 4.5 minutes and the radio has the following setup:<br>- Display is blank.<br>- Turn off variable rate random transmit data<br>- Carrier is disabled.<br>This test command forces the radio into CDMA mode. |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 57X# | CP_Mode | | Select radio call processing mode. This command will set up the radio to operate in the mode selected and will also perform initialization as specified by the INIT command. The synthesizer will be reprogrammed to setup parameters for the mode selected.<br>0 AMPS signalling (stop call processing test commands and PCM Loopback)<br>1 Not supported - NAMPS signalling<br>2 Not supported - Reserved for NAMPS expansion<br>3 Not supported - Reserved for NAMPS expansion<br>4 Not supported - Reserved for NAMPS expansion<br>5 CDMA signalling (stop call processing test commands and PCM Loopback)<br>6xy SIMVC test command<br>From the handset, x is the maximum rate and y is the minimum rate.<br>Valid rates for x and y are:<br>4 - Full rate<br>3 - Half rate<br>2 - Quarter rate<br>1 - Eighth rate<br>From the Computer, no parameters are accepted and Full rate is forced. (This is not supported yet)<br>7 Start PCM Loopback<br>8 CDMA T-Tester mode (channel must be set by LOAD-SYTH. Handset only).<br>9 Not supported - CDMA force random data transmis-sion<br>12 Stop CPU - There is no way out of this except cycling power. |
| 58# | COMPD-ON | | Turns on the computer. |
| 59# | COMPD-OFF | | Turns off the computer. |
| 60#-67# | not used | | |
| 68# | Read Model | | MODEL Read radio model type.<br>Displays three radio model bytes: hardware (model), flex (type), and factory. |
| 69#-71# | not used | | |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 72X | gain phase | | Program AMPS (only) gain phasing values through the handset.<br>Gain phasing depends on the call processing mode. It is the responsibility of the user to select the proper call processing mode before using this test command.<br>This command reprograms the EEPROM phasing values for MOD, MIC, AUX, etc.<br>The value in X selects which step to start on. If no value for X is entered, it will start at step 0.<br>The command keys are defined in Table 1: “Handset Command Key Entry” on page 13.<br>NOTE: If you power down the radio after changes are made, the power up sequence re-programs the hardware with the correct phasing values.<br>Refer to the “Tests and Adjustments” on page 47 for instructions on entering parameters from the keypad.<br>AMPS GAIN PHASING RANGE<br>STEP # PARAMETER (HEX)<br>00-04 MOD 0- MOD 4 0-7<br>05 Aux. audio path deviation 0-1<br>06 MIC audio deviation 0-F<br>07 DTMF deviation 0-3<br>08 Data deviation 0-3<br>09 SAT deviation 0-3<br>0A Discriminator audio gain 0-7<br>0B AFC WARP Analog 0-FF |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 73# | PWR-Phase | | Programs power phasing values through the handset.<br>Power phasing depends on the call processing mode. It is the responsibility of the user to select the proper call processing mode before using this test command.<br>This command reprograms the EEPROM phasing values for Max. Power Level, Attenuator Slope Adjust, etc.<br>The value in X selects which step to start on. If no value for X is entered, it will start at step 0.<br>The command keys are defined in Table 1: “Handset Command Key Entry” on page 13.<br>NOTE: If you power down the radio after changes are made, the power up sequence re-programs the hardware with the correct phasing values.<br>Refer to “Tests and Adjustments” on page 47 for instruc-tions on entering parameters from the keypad.<br>Analog Power Level Parameters:<br>RANGE<br>STEP # POWER LEVEL (HEX)<br>00 Power Step 0 00-FF<br>01 Power Step 1 00-FF<br>02 Power Step 2 00-FF<br>03 Power Step 3 00-FF<br>04 Power Step 4 00-FF<br>05 Power Step 5 00-FF<br>06 Power Step 6 00-FF<br>07 Power Step 7 00-FF<br>08-0B Do Not Adjust<br>CDMA Power Level Parameters:<br>RANGE<br>STEP # POWER LEVEL (HEX)<br>00 Attenuator Slope Adjust 00-FF<br>01 Attenuator Offset Adjust 00-FF<br>02 Clamp Adjust 00-FF<br>03 VCA Slope Adjust 00-FF<br>04 VCA Offset Adjust 00-FF<br>05 PMax 1 (Chan. 991-1023, 1-100) 00-FF<br>06 PMax 2 (Chan. 101-322) 00-FF<br>07 PMax 3 (Chan. 323-544) 00-FF<br>08 PMax 4 (Chan. 545-766) 00-FF<br>09 PMax 5 (Chan. 767-990) 00-FF |

**Table 9:**

| *Keypad Entry* | *Command Description* | *Status Display* | *Result* |
|---|---|---|---|
| 73# | PWR-Phase | | STEP # POWER LEVEL (HEX)<br>0A Ch. Gain Adj. 1 (Chan. 991-1023, 1-100) 00-FF<br>0B Ch. Gain Adj. 2 (Chan. 101-322) 00-FF<br>0C Ch. Gain Adj. 3 (Chan. 323-544) 00-FF<br>0D Ch. Gain Adj. 4 (Chan. 545-766) 00-FF<br>0E Ch. Gain Adj. 5 (Chan. 767-990) 00-FF<br>0F TX Gain Adjust 1 00-FF<br>10 TX Gain Adjust 2 00-FF<br>11 TX Gain Adjust 3 00-FF<br>12 TX Gain Adjust 4 00-FF<br>13 TX Gain Adjust 5 00-FF<br>14 TX Gain Adjust 6 00-FF<br>15 TX Gain Adjust 7 00-FF<br>16 TX Gain Adjust 8 00-FF<br>17 VC Sense Slope Adjust 00-FF<br>18 VC Sense Offset Adjust 00-FF<br>19 VC Sense Zero Adjust 00-FF<br>1A Available 00-FF<br>1B Not Available 00-FF |

## NAM Programming

### Introduction

The Number Assignment Module (NAM) is a section of memory that retains information about the phone's characteristics, such as the assigned telephone number, system identifi-cation
number, and options information.
Two methods are available to program the NAM using the keypad: Test Mode and User Mode.
Regardless of the method used, the NAM must be programmed before the phone can be placed into service. This chapter covers the NAM Programming steps for Test Mode NAM Programming.

### Test Mode Programming

Table 3: "Minimum Required Test Mode NAM Programming Steps" on page 25 shows
the minimum required Test Mode NAM programming steps. Table 4: "Test Mode NAM Programming Sequence" on page 26 lists all NAM programming steps, complete with parameters and definitions.

**IMPORTANT**

Consult with the System Operator regarding NAM information. Incorrect NAM entries can cause the phone to operate improperly or not at all.
.
For Test Mode NAM programming, the portable must be in the Servicing Level of Manual Test Mode (See "Test Mode/Test Menu" on page 11.) To enter test mode, the Manual Test pin (recessed center pin of the J6 battery connector) must be momentarily grounded while powering up the phone. This can be accomplished in a variety of ways, such as by using a 6.8 VDC power

supply and an MCEL 2000 test cable or test plug. After powering up in test mode, press the # button to enter Servicing Level. Once in Test Mode Servicing Level, enter 55# to place the phone in NAM programming mode. The display will show factory default NAM data or show new data as it is entered, scrolling from left to right. Sequentially step through the procedures shown in Table 4: "Test Mode NAM Programming Sequence" on page 26 using the * key. Enter new data as required, or skip past factory default values for parameters that do not need to be changed.

If a second phone number is to be programmed, step 11 bit 6 must be set to 1. This bit enables dual-NAM operation and will cause NAM programming steps 1-6 and 12 to be repeated for the second phone number.

**Minimum Required Test Mode**

**NAM Programming Steps**

**Table 10:**

| Service Type | Minimum Required Programming Steps |
|---|---|
| Single NAM<br>Dual NAM (part A)<br>Dual NAM (part B) | 1, 3, 4, 6, 8, 9<br>1, 3, 4, 6, 8, 9, 11<br>1, 3, 4, 6 |

**Test Mode NAM Programming Sequence**

Advances to the next programming step; also programs the NAMafter the last programming step is entered. A valid value must be entered. Otherwise the phone will not advance to the next NAM step.

Clears the entered information and displays previously entered data for the current programming step.

Exits the programming mode without programming the NAM.

**Test Mode NAM Programming Sequence**

**Table 11:**

| *Step* | *Factory Default* | *Description* |
|---|---|---|
| 01 | 00000 | CLR=<br>**Home System ID (SID) Number.** Number assigned by system operator for system identification. |
| 02 | 00000100 | #<br>**A OPTION BYTE.** The display for step 02 represents the status of eight options, A7 through A0. Bit A7 (msb) is programmed first, followed by A6-A0. Bits enter display on the right and scroll left. |
| | 0 | **Local Use (Bit A7).** If set to 1 phone will respond to local control orders in the home area or when the group ID is matched. Assigned by system operator. |

**Table 11:**

| *Step* | *Factory Default* | *Description* |
|---|---|---|
| | 0 | **Preferred System (Bit A6).** Applies to units capable of operating on two service systems (A or B). 0 = system B; 1 = system A. |
| | 0 | **End-to-End Signaling (Bit A5).** When enabled, the phone is equipped for DTMF signaling during a call. 1 = enabled, 0 = disabled. |
| | 0 | **Markov test override MSB (Bit A4).** Enter 0. |
| | 0 | **Markov test override (Bit A3).** Enter 0. |
| | 1 | **Bit not used (Bit A2).** Enter 1. |
| | 0 | **Markov test override LSB.** Enter 0 |
| | 0 | **MIN Mark (Bit A0).** Supplied by system operator. When enabled the user's area code will be sent with each call initiated or answered. 1 = enabled, 0 = disabled. |
| 03 | 1111110111 | **User 10 digit radiotelephone phone number (MIN).** 10_digits including area code; changing this value sets default for AOC. Number is assigned by system operator. |
| 04 | 010<br>042<br>074<br>106 | **Station class mark (SCM).** A 2 digit number assigned by the system operator. Indicates maximum power step, VOX capability, and number of channels used.<br>CDMA only & Non-Slotted mode configuration<br>CDMA only & Slotted mode configuration<br>Dual Mode & Non-Slotted mode configuration<br>Dual Mode & Slotted mode configuration |
| 05 | Last digit of access over-load class | **Access overload class.** Specifies the level of priority assigned to the phone when accessing the system. Assigned by system operator. |
| 06 | 000000 | **Security code.** A 6-digit number supplied by the user. This number is used by the user to access or change "security" features such as the 3-digit unlock code or the service level. |
| 07 | 123 | **Unlock code.** A 3-digit number supplied by the user. If the lock feature is enabled by the user, the phone can be operated only by individuals who know the unlock code. |
| 08 | 4 | **Service level.** This 1-digit number supplied by the user allows various call placement restrictions if desired. |

**Table 11:**

| *Step* | *Factory Default* | *Description* |
|---|---|---|
| 09 | 01100000 Test Menu enabled<br><br>00100000 Test Menu disabled<br><br>0 | **B OPTION BYTE** The display for step 10 represents the status of eight options, B7 through B0. B7 (msb) is programmed first followed by B6-B0. Bits enter display on the right and scroll left.<br><br>**Display Pilot Set Status/AMPS Status Mode (Bit B7).**<br>CDMA: These statistics are useful for testing handoff parameters. When enabled, this feature displays the strongest pilot offset in the "Active Set" (only member during Idle) on the top line of the display, and the strongest pilot in the "Neighbor Set" on the bottom line. Each line has the same format. The left most 3-digit number is the pilot offset, and the right number is a relative signal strength.<br>IDLE HANDOFF (handoffs on a paging channel) occurs when a Neighbor pilot is judged to be better. That neighbor pilot will be promoted to the active set, and thus move to the top line of the display.<br>SOFT HANDOFF (handoff on a traffic channel) occurs when a Neighbor pilot fulfills requirements set by the network, and the network directs the mobile to add the new pilot to the Active Set.<br>Pilot Set status is enabled by setting Step #9, bit #7 to 1. Channel Statistics is disabled by setting Step #9, bit #7 to 0.<br>**WARNING: Turning on this option makes it difficult to see the Markov error rate statistics in a call.**<br>AMPS: In AMPS mode, setting this bit to 1 causes status information similar to current Motorola AMPS products to be displayed. The contents of the display depends on the channel being monitored. |
| | 0 | **Test Menu (Bit B6).** This bit allows the user to enable or disable the FCN key Test Menu. Refer to "Test Menu" on page 12 for further information on Test Menu.<br>1 = enabled, 0 = disabled. |
| | 1 | **Paging Channel Message Filtering (Bit B5).** This bit limits the amount of paging channel messaging seen by the data logger debugging tool. A user not using this tool should see no noticeable difference in performance.<br>1 = enabled, 0 = disabled. |
| | 0 | **Portable Data Logging (Bit B4).** Enter 0. |

**Table 11:**

| *Step* | *Factory Default* | *Description* |
|---|---|---|
| | 0 | **Single Serving System Scan (Bit B3)**. This bit allows the user to enable or disable the serving system scanning on serving systems other than the phone's home serving system. If the phone has an odd Home System Identifier (Step 1), it's home serving system is A, otherwise it is B. If Single Serving System Scanning is enabled, only the home serving system will be scanned, otherwise both serving systems will be scanned.<br>1 = enabled, 0 = disabled. |
| | 1 | **Auto Recall (Bit B2).** When set to one, the user may access repertory by a one or two digit send sequence (speed dialing). |
| | 0 | **Disable Service Levels (Bit B1).** If set to 1, the service level (call restric-tions)<br>cannot be changed by the user. |
| | 0 | 0 **Lock Disable (Bit B0).** When set to 1, the user cannot lock and unlock the phone unit via the 3 digit lock code. |
| 10 | 00000000 | **C OPTION BYTE** The display for step 11 represents the status of eight options, C7 through C0. C7 (msb) is programmed first followed by C6-C0. Bits enter display on the right and scroll left. |
| | 0 | **User Mode NAM Programming Disable (Bit C7).** When set to 1, User Mode NAM programming cannot be accessed. |
| | 0 | **Dual NAM System Registration Enable (Bit C6).** Enter 1 if dual NAM operation is desired (for models capable of dual system operation).<br>Enter 0 for single NAM operation |
| | 0 | **Test Mobile Enable/Auto Answer (Bit C5).** Enter 0. |
| | 0 | **Auto Redial Disable (Bit C4).** When set to 1, the user cannot access the 6-minute auto redial feature. |
| | 0 | **Three Wire Bus Speaker Disable (Bit C3).** This bit is used to disable internal handset speaker when adding V.S.P. option. 1 = handset speaker disabled,<br>0 = handset speaker enabled. |
| | 0 | **Bit not used (Bit C2).** Enter 0. |
| | 0 | **Selectable System Scan Disable (Bit C1).** When set to 1, the user cannot select the primary system. |
| | 0 | **Diversity Antenna (Bit C0).** (Extended systems only)<br>0 = Non-diversity, 1 = Diversity. |
| 11 | 0334 | **AMPS Initial paging channel.** There are 4 significant bits for the initial paging channel. For system A enter 0333 and system B enter 0334. |
| 12 | 0333 | **AMPS Initial A system channel.** To initialize system A enter 0333. |

**Table 11:**

| *Step* | *Factory Default* | *Description* |
|---|---|---|
| 13 | 0334 | **AMPS Initial B system channel.** To initialize system B enter 0334. |
| 14 | 021 | **AMPS Dedicated Paging Channels.** Number of dedicated paging chan-nels is 21. Enter 021. |
| 15 | 00001000 | **D OPTION BYTE**. The display for step 16 represents the status of eight options, D7 through D0. D7 (msb) is programmed first, followed by D6-D0. Bits enter display on the right and scroll to left. |
| | 0 | **Enhanced Scan (Bit D7)**. Enter 1. |
| | 0 | **Cellular Connection 1 (Bit E6)**. Normally set to 0. |
| | 0 | **Long Tone DTMF Enable (Bit E5)**. Normally set to 1. |
| | 0 | **Transportable Transducer Disable (Bit E4)**. Enter 0. |
| | 1 | **Bit not used (Bit E3)**. Normally set to 0. |
| | 0 | **Handset Test Mode Disable (Bit E2)**. Enter 0. |
| | 0 | **Failed Page Indication Disable (Bit E1)**. |
| | 0 | **Word Sync Scan Disable (Bit E0)**. Set to 1. |
| 16 | 00100111 | **E OPTION BYTE**. The display for step 16 represents the status of eight options, E7 through E0. E7 (msb) is programmed first, followed by E6-E0. Bits enter display on the right and scroll to left. |
| | 0 | **Bit not used (Bit E7)**. Enter 0. |
| | 0 | * **Preferred mode (Bit E6)**. Normally set to 0.<br>Bit 6 - 1 and Bit 5 - 1 = Analog preferred<br>Bit 6 - 1 and Bit 5 - 0 = Analog only |
| | 1 | **Preferred mode (Bit E5)**. Normally set to 1.<br>Bit 5 - 1 and Bit 6 - 1 = CDMA preferred<br>Bit 5 - 1 and Bit 6 - 0 = CDMA only |
| | 0 | **Extended Address Method (Bit E4)**. Enter 0. |
| | 0 | **Preferred Analog Serving System (Bit E3)**. Normally set to 0. |
| | 1 | **Config. for mob term using home SID, NID pair (Bit E2)**. Enter 1.<br>1 = Allow mobile terminated call while using a home (SID, NID) pair.<br>0 = Disallow mobile terminated call while using a home (SID, NID) pair. |
| | 1 | **Config. for mob term while SID roamer (Bit E1)** Enter 1.<br>1 = Allow mobile terminated call while a SID roamer.<br>0 = Disallow mobile terminated call while a SID roamer. |

**Table 11:**

| *Step* | *Factory Default* | *Description* |
|---|---|---|
| | 1 | † **Config. for mob term while NID roamer (Bit E0)**. Enter 1.<br>1 = Allow mobile terminated call while a NID roamer.<br>0 = Disallow mobile terminated call while a NID roamer. |
| 17 | 0 | **CDMA: Slot Cycle Index.** TBD |
| 18 | Entry Required | **CDMA: SID (SID_NIDp).** Up to 5-digits. |
| 19 | 00000 | **CDMA: Network ID Number (NID of SID_NIDp).** Up to 5-digits. |
| 20 | 111111 | **Mobile Country Code (first 3-digits), IMSI 11 (1-digit), IMSI 12 (1-digit).** |
| 21 | Entry Required | **CDMA: Primary Channel.** System A up to 4 decimal digits. |
| 22 | Entry Required | **CDMA: Primary Channel.** System B up to 4 decimal digits. |
| 23 | Entry Required | **CDMA: Secondary Channel.** System A up to 4 decimal digits. |
| 24 | Entry Required | **Secondary Channel.** System B up to 4 decimal digits. |
| 25 | 0 | **Data Logger Switch.** Enter 0.<br>1 = enabled, 0 = disabled. |

* These bits will determine which modes of operation the radio will attempt when seeking communication with a Base Station. Care should be taken when either the CDMA only or the Analog only modes of operation are selected, because this configuration will cause a dual mode phone to operate as a single mode phone. Another issue to be aware of is that whenever Bit 5 is set to 0, no handoffs between Analog and CDMA mode can take place. No examination of the RF environment is performed when setting these fields.

† Setting these bits also effects the registrations that are transmitted by the Mobile Station. If bits are set such that the Mobile cannot receive any incoming calls (in CDMA mode), it is not necessary to send out any Registration mes-sages. It should be noted that if all Mobile Terminated Call Preference bits are set to zero, that there would (in a spec compliant system) be no way for the

Mobile Station to receive incoming calls.

# DISASSEMBLY

### Introduction

Care must be taken during the disassembly and reassembly of the unit in order to avoid damaging or stressing the housing and internal components. Ensure that a properly grounded high impedance conductive wrist strap is used while
performing these procedures on electronic units.

### Recommended Tools

The following tools are recommended for use during the disassembly and reassembly of the phone.
- Anti-Static Mat Kit (0180386A82); includes:
- Anti-Static Mat 6680387A95
- Ground Cord 6680334B36
- Wrist Band 4280385A59
- Plastic Prying Tool SLN7223A
- Rear Housing Removal Tool
- Dental Pick
- Tweezers
- T6 Torque Screw Driver

### CAUTION

Many of the integrated circuit devices used in this equipment are vulnerable to damage from static charges. An anti-static wrist band, connected to an anti-static (conductive) work surface, must be
worn during all phases of disassembly, repair, and reassembly.

### Disassembly Procedure

Refer to the disassembly instructions and photo sequence on the following pages.

### Assembly Procedure

Once the unit is disassembled and the repair is carried out it then becomes obvious that to assemble the unit, the procedure is the reverse of that previously completed for disassembly.

### Antenna Removal

1-1 Turn off the power.
1-2Remove a Rubbor Boot.
1-3 Remove antenna by turning counter-clockwise.

© 2000 Motorola, Inc.

.

## 2.Disassembly of Battery

2-1 Push the Latch and then remove the Battery Housing out of the front housing.

2-2 After removing Battery Housing lift up the Battery

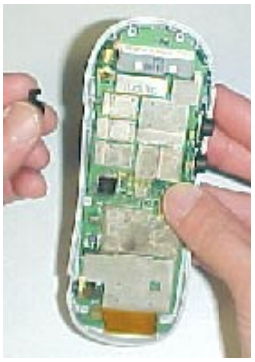
## .3.Disassembly of Rear Housing

At first ,remove screws on top of Rear Housing, and then Bottom Last, remove screws on the middle of Rear Housing.

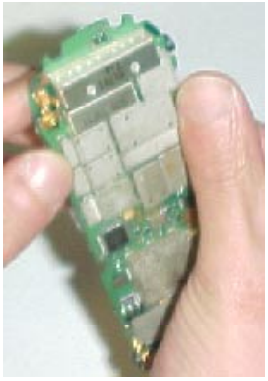
## 4.Disassembly of PC Boards.

4-1 After removing Rear Housing , remove

Side Buttons one by one.



4-2.Disassemble PC Boards into Front housing and PC Boards by carefully pulling one against another.



## 5.Disassembly of LCD

5-1 Disassemble LCD by pulling Snap Fit to a both side

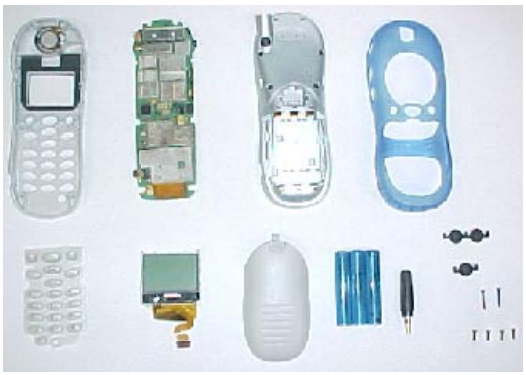
5-2 Remove the LCD by inserting a in the top of Zif Connector and lifting it away from the attached surface.

## 6.Disassembly of Key Pad

6-1 Remove a Key Pad.

## 8. Complete Disassembly Layout.

## 7. Remove the Groumet, RF Test,



### using antenna screw

* Before unscrewing antenna, make sure to align the straight indent that exists on the surface of Rear Housing .

# Troubleshooting

## Introduction

Known good replacement parts and assemblies should be available to be used for troubleshooting by substitution, and for replacement of defective parts/assemblies. Defective circuit boards should be forwarded to the appropriate Motorola service facility for repair. Refer to the "Replacement Parts" section of this manual for a list of replacement part descriptions and part numbers.

**CAUTION**

**Many of the integrated circuit devices used in this equipment are vulnerable to damage from static charges. An ESD-safe workstation should be used when-ever a transceiver is opened.**

## Troubleshooting and Repair

The troubleshooting chart in Table 7, "Assembly Replacement Level Troubleshooting and Repair Chart," on page 56 shows some typical malfunction symptoms and the corresponding verification and repair procedures. Refer to the disassembly instructions located in the "Disassembly" section of this manual for instructions on removing parts/assemblies.

## Testing after Repair

After any repair work has been carried out, the unit should be thoroughly tested to ensure that it operates correctly. This is especially important if the Logic / RF assembly is replaced.

For general repairs which do not include replacing the Logic/RF assembly, simply placing a call and checking signal strength, and transmit and recieve audio quality is normally sufficient.

When the Logic/RF assembly is replaced, the unit must have a comprehensive test on a compatible communications analyzers. See "Testing" for further details. Placing a call on air is usually carried out at this stage to complete the testing procedure.


© 2000 Motorola, Inc.

## LOGIC TROUBLESHOOTING

### Phone is not powered on(1)

#### Battery Discharged

Measure battery voltage and if the battery voltage is <3.6 V DC, recharge the battery using the AC charger.

#### Battery contact opened or misaligned

Supply the B+ power through test port J3002(B+), J3001(GND) by using the test interface cable. If the phone is powered on, check the battery fail or battery contact defect

#### B+ Supply defective

Apply the power BATT+ through the battery contact. Check the B+ voltage by measuring 3.6-4.2V at the pin 48 of U2000 CCAP lite. If the B+ doesn't come out, check the Q3300

#### Power Supply defective

Supply the B+ power through test port J3002(B+), J3001(GND) by using the test interface cable.

Depress the PWR button and measure the supplied voltage of each part within 300ms of start of ON_OFF signal.

Check the Logic_4.75 voltage by measuring 4.75V at the pin 41 of U2000 CCAP lite

Check the Logic_2.75 voltage by measuring 2.75V at the pin 28 of U2000 CCAP lite

Check the Audio_2.75 voltage by measuring 2.75V at the pin 22 of U2000 CCAP lite

Check the Logic_1.8 voltage by measuring 2.75V at the pin 3 of U2000 CCAP lite

If the above supply voltages don't create by CCAP lite, Replace the U2000 part or check the logic 2.75 / Audio 2.75 power path shortage

### Phone is not powered on (2)

#### Reset Signal

Check the RESETB Signal from CCAP lite U2000 by measuring the voltage of C2044 or pin 30 of U2000

Depress PWR button, then the RESETB signal shall maintain 'Low' for approximately 255msec after power on and go to 'High'

If reset signal don't come out, check the CCAP U2000 part.

### Clock Fail

Check the 16.8MHz reference clock by measuring the signal via C1994 (Nominal 1.0 Vp-p sine-wave)

If 16.8MHz clock is not probed, check the reference oscillator part of RF side.

Depress PWR button, then Check the clock from the CIA as below

CLK0 : 5.6Mhz CRIB input clock (measured via TP1915)
CLK1: 32.749khz RF dither circuit clock (measured via R332)
CLK2: 32.749khz MCU input clock (measured via TP1913)
CLK3: 1.12Mhz DSP input clock (measured via TP1912)
CHIPx8: 9.8304Mhz Chipx8 clock (measured via TP1911)
Check the 32.768khz crystal clock (measured via R1142)
32khz_Buff_out: 32.768khz sleep mode clock out (measured via TP1130)

### Casper 68338 PLL locking

Verify the 68338 CPU PLL locking by measuring the XFC signal through C1154

After Logic 2.75V &1.8V supplied to Casper U1100, XFC level shall be 650-700mV

After RESETB signal released, XFC level shall be 850-900mV within 10ms of CPU start.

If PLL locking is failed, Replace the U1100 Casper or Check the PLL circuit (C1152, C1153, C1154, R1151)

### Phone is not powered on (3)

### Check Watchdog

Check watchdog level from CASPER to CCAP lite by measuring the WDI level via R1181.

Depress PWR button, then the WDI signal maintain ‘Low’ for approximately 270~280 msec after power on and goes to ‘High’

Take off the R1181 0Ohm resister and put the 1kOhm resister to the R1180 DNP

Check if the phone operate normally.

If the phone is not powered on and logic_2.75 doesn’t go down, it show the program does not perform normally (Casper, Memory, CIA etc.or Software failure)

### Check the phone mode

Check the manual test line via R1178

If the manual test line is ‘Low’, the phone will go to flash mode and if ‘High’, the phone will go to the normal turn on sequence.

In flash mode, if the flash programmer recognize the phone UART, the possible defect is on the

Software.

Flash the phone with right version, or replace to the programmed Flash part

### Verify by EST Box

Connect the J3901-J3910 port to EST box BDM cable.

Take off the R1181 0Ohm resister and put the 1kOhm resister to the R1180 DNP

Execute the Vision Click tool and set up the MCU register of EST

Read the Flash code from $000000 and verify the the right hex code can be read.

Test the SRAM area $600000 - $63FFFF via memory test diagnostics tool

If the Flash or SRAM defect is found, Replace the parts.

### No Display

### Connection Failure

Check the 16pin J3200 Display Connector's connection to Flex cable of Display.

If the connection defective is found, repair the connection or replace the 16pin J3200 connector

### Electrical Interface Failure

Check the J3200 soldering status and re-solder the connector

Check the interface signal LCD logic_2.75 (measured via R3200), LCD reset signal (measured via R3201) and D0-7, EL, AL0 signal from the board to LCD.

If more than one signal defect is found, repair the cause.

### Display module Defect

Assemble the Display module to a known good Shark main board, and check the function.

If the display fail is not solved, replace the Display module with new good one.

### Display is erratic or partial no display

### Connection Failure

Check the 16pin J3200 Display Connector's connection to Flex cable of Display

If the connection defective is found, repair the connection or replace the 15pin J3200 connector

### Display module Defect

Assemble the Display module to a known good Shark main board, and check the function.

If the display fail is not solved, replace the Display module with new good one.

### No LED Backlight

### LED BL Regulator defect

Set the phone mode as a 'Backlight Always On' of 'Backlight Select' of 'Display Options' menu.

Verify the 2.8V BL Regulator Vout via U2400 pin 4 and BL control signal 'High' via U2400 pin 1

If the 2.8 Voltage BL Regulator Vout is failed with BL control signal 'High', replace the U2400 regulator IC.

### Dim LED

If any dim LEDs are found out of 4 LCD LEDs and 8 keypad LEDs, measure Vf voltage of the dim LEDs on the point of LED Anode (The typical Vf is 2.03 volt)

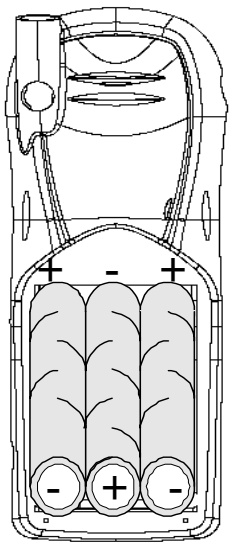
If the Vf is too high, replace the LED with good one.

### No turn-On LED

If any dim LEDs are found out of 4 LCD LEDs and 8 keypad LEDs, replace the LEDs with good ones.

## Trouble Shooting(Power-up)

### a) Battery either discharged or defective.




1. Measure battery voltage across a 50 ohm (>1 Watt)load.

2. If the battery voltage is <3.4 V DC, recharge the battery using the appropriate battery charger.

3. If the battery will not recharge, replace the battery.

### b) Battery mis-aligned.

1. Visually inspect the battery polarity

2. Check if two battery contact terminals of rear

housing are able to match battery contacts on board.

### c) Shield defective

1. Check if carton tape is on power shield

2. Check if power shield can are short to battery contacts

### d) Components defective

1. Change L2000 if BOOST is same to B+.

2. Check 16.8MHz if Logic_2.75 and Aud_2.75 is high.

3. Check u-P(U1100) and memory(U1200, U1300) if WDI is low

### e) When charger is attached at low battery

1. Check if drain of Q2 is high for 1.5sec after charger is attached

2. Check if base voltage of Q2207 is 0.7V during Q2 is on

## Trouble Shooting(Power Down On 'SND')

### a) Battery either discharged or defective.

1. Measure battery voltage across a 50 ohm (>1 Watt) load.

2. If the battery voltage is <3.4 V DC,

   recharge the battery using the appropriate battery charger.

3. If the battery will not recharge, replace the battery.

### b) PA defective

1. Setup the power supply : 4.5V, 500mA

2. Setup the HP8924 : Sectr A Pwr(-83dBm), Data rate(random)

3. Check current drain of phone at call state. Does power supply display 'CC' ?

4. Check if the bias point(PA_VGG1) of PA is -1.3V~-3V and do Phasing.

## Trouble Shooting(Accessory Not Working)

1. Check if the voltage range of CHG_SNS_CIA is 1.7V~< 2.4V on VPA

2. Check if the voltage of CHG_SNS_CIA is 0.8V~1.7V on EIHF

3. Check if the voltage of CHG_SNS_CIA is below 0.8V on AC charger

4. Check if the voltage of EXT_B+ is more .45V than battery voltage during charging

## Trouble Shooting(Battery defective)

### a) battery cannot be charged.

1.Push the button 'FCN'+'0'+'0'+'*'+'*'+'8'+'3'+'7'+'8'+'6'+'6'+'3'+'3' +'STO' and set into test mode.

2. Store 11000000 at 5509# and press 01# sequentially to restart phone.

3. Push the button 'FCN' twice and select the 'Battery Status Mode On'

4. You can see following message on LCD

5. If the temperature of the battery is -40'C, check the thermistor node on bad soldering.

AAA = Average battery temperature

'C = Unit of temperature

D = 0 : charger is off

1 : charger is on

E = V : VPA(CLA, fast charger)

E : EIHF(DHFA, fast charger)

A : AC charger(slow charger)

F.FFV = Average battery voltage

GGG = Ideal (non phased) charger current in mA

HHH = N / A

I = Charger algorithm state

0 : Destroyed

1 : Battery detects

2 : No charge

*3 : Rapid charge

*4 : Top off charge

*5 : Maintenance charge

*6 : Paused

7 : COVIC charging

J = N : Nickel Battery

### b) battery cannot be charged insufficiently

1. check whether the voltage of battery displays more 50mVthan actual battery voltage

2. If that, do voltage phasing again.

3. Check if the voltage of EXT_B+ is more .45V than battery voltageduring charging

| *Symptom* | *Probable Cause* | *Verification and Remedy* |
|---|---|---|
| 1. Phone will not turn on or stay on. | a) Battery either discharged or defective. | 1. Measure battery voltage across a 50 ohm (>1 Watt) load.<br>2. If the battery voltage is <3.4 V DC, recharge the battery using the appropriate battery charger.<br>3. If the battery will not recharge, replace the battery. |
| | b) Battery connector open or misaligned. | 1. Visually inspect the battery connectors on both the battery pack and the transceiver, including the solder connections from the battery connector to the main PC board.<br>2. Realign the contacts or, if necessary, replace either the battery or battery connector. |
| | c) Keypad membrane defective. | 1. Replace the keypad membrane with a known good part.<br>2. Temporarily connect +6 V DC to the battery contacts.<br>3. Depress the **PWR** button; if unit turns on and stays on, disconnect the power source and reassemble the phone with the new keypad membrane. |
| | d) Keypad board defective. | 1. Replace keypad board assembly with a known good assembly.<br>2. Temporarily connect +6 V DC to the battery contacts. Depress the **PWR** button.<br>3. If the units turns on and stays on, discon-nect the power source and reassemble the phone with the new keypad board assembly. |
| | e) RF/Audio-Logic Board defective. | 1. Remove the RF/Audio-Logic Board. Substitute a known good board.<br>2. Temporarily connect +6 V DC to the battery contacts.<br>3. Depress the **PWR** button; if unit turns on and stays on, disconnect the power source and reassemble the phone with the new RF/Audio-Logic board and re-test phone. |
| 2. Phone exhibits poor reception and/or erratic operation (such as calls frequently dropping, weak and/or distorted audio, etc.) | a) Defective antenna or damaged antenna connector.<br><br>b) Defective RF/ Audio-Logic Board. | 1. Make sure the antenna shaft ferrule is screwed into the antenna socket.<br>2. Make sure pin on antenna coil is seated in antenna connector socket.<br>3. Replace the antenna with a known good antenna.<br><br>Replace the transceiver board (refer to symptom 1c Verification and Re edy.) |

| *Symptom* | *Probable Cause* | *Verification and Remedy* |
|---|---|---|
| 3. Display is erratic, or provides partial or nodisplay. | a) Defectivedisplay module. | 1. Gain access to RF/Audio-Logic board or keypad board as described in the “Disassembly” section of this manual.<br>2. Check connection. If connection not at fault, proceed to b. |
| | b) RF/Audio-Logic board defective. | Replace the RF/Audio-Logic Board (refer to symptom 1f Verification and Remedy). |
| 4. Alert ringer volume is distorted or too low. | a) Alert ringer defective. | Replace the defective speaker or alert ringer with a known good speaker or alert ringer. |
| | b) RF/Audio-Logic board defective. | Replace the RF/Audio-Logic Board (refer to symptom 1f Verification and Remedy). |
| 5. Transmit audio is weak, distorted, or dead. | a) Microphonedefective. | Replace defective microphone. |
| | b) RF/Audio-Logic board defective. | Replace the RF/Audio-Logic Board (refer to symptom 1f Verification and Remedy). |
| 6. Receive audio is weak and/or distorted. | a) Speaker defective. | Replace defective speaker. |
| | b) RF/Audio-Logic board defective. | Replace the RF/Audio-Logic Board (refer to symptom 1f Verification and Remedy). |

# Replacement Parts

**Table 12:**

| | |
|---|---|
| SWF0579AC | |
| XCVR SHARK CDMA SB TA BLK MX | |
| | |
| Part # | Description |
| | |
| 0187851L01 | ASSY XCVR SHARK SB |
| | |
| 1209185A48 | TSPEC S/B SHARK CDMA 800MHZ |
| | |
| 1209187A29 | TSPEC TRANSCEIVER LABELING INS |
| | |
| SHN7609A | H&H SHARK GSM COMMON |
| | |
| 0585977K01 | GROMMET RF MOD3 |
| | |
| 4085941K01 | SW ARRAY MYLAR DOMES MOD3 |
| | |
| 5009005J13 | ALERT 12 MM SHARK CONTACTED |
| | |
| 5009076E25 | SPEAKER, 20 MM DYN SHARK |
| | |
| 5009135L07 | MIC ELECT 6MM PINS |


© 1999 Motorola, Inc.

**Table 12:**

| | |
|---|---|
| SHN7815A | H&H SHARK UNQ CDMA BLACK SB |
| | |
| 0309315B07 | SCREW TORX PLUS W/AUTOSER 1.8 |
| | |
| 1585830K01 | HSNG FRNT ASSY LKZ1 BLK |
| | |
| 1585832K03 | REAR HSNG ASSY W/O SIM & STRA |
| | |
| 3285837K02 | GRIP L FT LKZ BLK M3 |
| | |
| 3285838K04 | GRIP RT SMART LKZ1 |
| | |
| 3885839K05 | KYPD M3 LKZ CDMA ENGLISH |
| | |
| 6185840K04 | LENS MODULUS 3 |
| | |
| 7288454K02 | ASSY DISPLAY MOD SHARK |
| | |
| 8589464K03 | ANT ASSY SHARK CDMA 800 |
| | |
| SYN7828C | XCVRBRD SB MOD 3 CDMA |
| | |

# SYN7828C

| Ref Des | Part # | Description |
|---|---|---|
| A1 | 3989033K01 | CONT ANT SHARK |
| ANTGND_2 | 4209935N03 | CLIP Z |
| C100 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C101 | 2113743N18 | CAP CHIP 4.7 PF +-.25PF COG |
| C104 | 2113743E20 | CAP CHIP .10 UF 10% |
| C106 | 2113743E20 | CAP CHIP .10 UF 10% |
| C107 | 2113743N12 | CAP CHIP 2.7 PF +-.25PF COG |
| C108 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C11 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C1100 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1101 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1102 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1103 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1104 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1105 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1107 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1108 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1109 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1131 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1132 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1141 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C1142 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C1152 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |

| | | |
|---|---|---|
| C1153 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1154 | 2113741F49 | CAP CHIP CL2 X7R REEL 10000 |
| C1170 | 2113928N01 | CAP CER CHIP 0.1UF 10% 6.3 |
| C1171 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C12 | 2113740F39 | CAP CHIP REEL CL1 +/-30 33 |
| C1200 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1201 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1300 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C14 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C152 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C154 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C155 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C156 | 2113743N12 | CAP CHIP 2.7 PF +-.25PF COG |
| C158 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C159 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C160 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C180 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C1800 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1801 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C1802 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C181 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C182 | 2113743N34 | CAP CHIP 22.0 PF 5% COG |
| C184 | 2113743N54 | CAP CHIP 150 PF 5% COG |
| C1900 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1901 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1910 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1911 | 2113741F13 | CAP CHIP CL2 X7R REEL 330 |

| | | |
|---|---|---|
| C1912 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C1920 | 2113741F25 | CAP CHIP CL2 X7R REEL 1000 |
| C1921 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1930 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C1940 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1941 | 2113741F23 | CAP CHIP CL2 X7R REEL 820 |
| C1950 | 2113743K15 | CER CHIP CAP .100UF |
| C1951 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1952 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1953 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1954 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1960 | 2113741F33 | CAP CHIP CL2 X7R REEL 2200 |
| C1961 | 2113743E10 | CAP CHIP .033 UF 10% X7R |
| C1962 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1990 | 2113743M08 | CAP CHIP 22000 PF +80-20% Y5V |
| C1991 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1992 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1993 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1994 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C2000 | 2109489T02 | CAP CER X5R 10UF 10% 16 1210 |
| C2001 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C2002 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2004 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2005 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2006 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2008 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2009 | 2113928A01 | CAP CER CHIP 1.0 UF 10V |

| | | |
|---|---|---|
| C201 | 2113743N17 | CAP CHIP 4.3 PF +-.25PF COG |
| C2010 | 2113928K09 | CAP CER CHIP 10.0 UF 6.3V 10% |
| C2011 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2012 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C2018 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C2019 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C202 | 2113743N19 | CAP CHIP 5.1 PF + -.5PF COG |
| C2020 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2021 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C203 | 2113743N11 | CAP CHIP 2.4 PF +-.25PF COG |
| C204 | 2113743N22 | CAP CHIP 6.8 PF + -.5PF COG |
| C2044 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2050 | 2113743E03 | CER CHIP CAP .015UF |
| C206 | 2113743N11 | CAP CHIP 2.4 PF +-.25PF COG |
| C2060 | 2113743E20 | CAP CHIP .10 UF 10% |
| C2061 | 2113743E03 | CER CHIP CAP .015UF |
| C2062 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C2063 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C2081 | 2113743E10 | CAP CHIP .033 UF 10% X7R |
| C2082 | 2113741F41 | CAP CHIP CL2 X7R REEL 4700 |
| C2083 | 2113743E20 | CAP CHIP .10 UF 10% |
| C2084 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C209 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C210 | 2113743N03 | CAP CHIP 1.0 PF +-.25PF COG |
| C213 | 2113743N12 | CAP CHIP 2.7 PF +-.25PF COG |
| C214 | 2113743N01 | CAP CHIP 0.5 PF +-.25PF COG |
| C215 | 2113743N12 | CAP CHIP 2.7 PF +-.25PF COG |

| | | |
|---|---|---|
| C216 | 2113743N19 | CAP CHIP 5.1 PF + -.5PF COG |
| C2200 | 2109489T02 | CAP CER X5R 10UF 10% 16 1210 |
| C2201 | 2113743G26 | CAP CHIP 4.7 UF 16V +80-20% |
| C2202 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2202 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2401 | 2113928A01 | CAP CER CHIP 1.0 UF 10V |
| C2402 | 2113743L33 | CAP CHIP 4700 PF 10% X7R |
| C2403 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2404 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2405 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2406 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2407 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2408 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2409 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2410 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2600 | 2113743E20 | CAP CHIP .10 UF 10% |
| C300 | 2113743E20 | CAP CHIP .10 UF 10% |
| C3000 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3001 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3002 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3003 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3004 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3005 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C301 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C302 | 2113743N36 | CAP CHIP 27.0 PF 5% COG |
| C303 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C304 | 2113743N24 | CAP CHIP 8.2 PF + -.5PF COG |

| | | |
|---|---|---|
| C305 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C306 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C307 | 2311049A76 | CAP TANT CHIP 2.2UF 10% 6V |
| C308 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C309 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| C3100 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3101 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3102 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3103 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3104 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3105 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3106 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3107 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3108 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3109 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3110 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3200 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3201 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3202 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C330 | 2113743L25 | CAP CHIP 2200 PF 10% X7R |
| C3300 | 2109489T02 | CAP CER X5R 10UF 10% 16 1210 |
| C3301 | 2113743E20 | CAP CHIP .10 UF 10% |
| C331 | 2113928G01 | CAP CER CHIP .22 UF 6.3V 10% |
| C332 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C3401 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C3500 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3501 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |

| | | |
|---|---|---|
| C351 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C352 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C3700 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3701 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3800 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3801 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3802 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C3803 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C400 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C402 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C403 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C405 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |
| C430 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C431 | 2113743N14 | CAP CHIP 3.3 PF +-.25PF COG |
| C432 | 2113743N11 | CAP CHIP 2.4 PF +-.25PF COG |
| C435 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C436 | 2113743E20 | CAP CHIP .10 UF 10% |
| C438 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C439 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C440 | 2113928P04 | CAP CER CHIP 1.0UF 20% 6.3V |
| C441 | 2113743N10 | CAP CHIP 2.2 PF +-.25PF COG |
| C442 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C443 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C444 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C445 | 2113740L18 | CAP CER CHIP 10.0 PF +/-.25PF |
| C500 | 2113928C03 | CAP CER CHIP 1.0 UF 6.3V 10% |
| C501 | 2113743N16 | CAP CHIP 3.9 PF +-.25PF COG |

| | | |
|---|---|---|
| C502 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C503 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C505 | 2113743N05 | CAP CHIP 1.2 PF +-.25PF COG |
| C506 | 2113743N24 | CAP CHIP 8.2 PF + -.5PF COG |
| C507 | 2113743E12 | CAP CHIP .047 UF 10% X7R |
| C508 | 2311049B08 | CAP TANT CHIP 1.0 UF 10V 10% |
| C509 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C60 | 2113928N01 | CAP CER CHIP 0.1UF 10% 6.3 |
| C600 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C601 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C602 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C603 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C604 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C61 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C616 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C62 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C621 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C624 | 2409154M15 | IND CER MLTILYR 15.0NH 1005 |
| C625 | 2113743N14 | CAP CHIP 3.3 PF +-.25PF COG |
| C626 | 2113743N10 | CAP CHIP 2.2 PF +-.25PF COG |
| C627 | 2113743N10 | CAP CHIP 2.2 PF +-.25PF COG |
| C628 | 2113743N14 | CAP CHIP 3.3 PF +-.25PF COG |
| C629 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C634 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C635 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C636 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |
| C637 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |

| | | |
|---|---|---|
| C638 | 2113743N42 | CAP CHIP 47.0 PF 5% COG |
| C639 | 2113743N20 | CAP CHIP 5.6 PF + -.5PF COG |
| C640 | 2113743N33 | CAP CHIP 20.0 PF 5% COG |
| C65 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C670 | 2113928C03 | CAP CER CHIP 1.0 UF 6.3V 10% |
| C671 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C672 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C676 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C677 | 2113743N12 | CAP CHIP 2.7 PF +-.25PF COG |
| C678 | 2113743N16 | CAP CHIP 3.9 PF +-.25PF COG |
| C679 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C682 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C684 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C685 | 2311049A89 | CAP TANT CHIP 22 UF 4V 10% |
| C690 | 2113743N58 | CAP CHIP 4.0PF 16V .25PF COG |
| C692 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C693 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C694 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C695 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C696 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C700 | 2113743E20 | CAP CHIP .10 UF 10% |
| C701 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C703 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C704 | 2113743E20 | CAP CHIP .10 UF 10% |
| C705 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C706 | 2113743E20 | CAP CHIP .10 UF 10% |
| C707 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |

| | | |
|---|---|---|
| C708 | 2311049B08 | CAP TANT CHIP 1.0 UF 10V 10% |
| C709 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C721 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C723 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C724 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C730 | 2113743L01 | CAP CHIP 220 PF 10% X7R |
| C731 | 2113743L01 | CAP CHIP 220 PF 10% X7R |
| C732 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C734 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C740 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C741 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C750 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C751 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C752 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C753 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C754 | 2113743L21 | CAP CHIP 1500 PF 10% X7R |
| C755 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C756 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C775 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C776 | 2113928N01 | CAP CER CHIP 0.1UF 10% 6.3 |
| C777 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C778 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C779 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C780 | 2113743E20 | CAP CHIP .10 UF 10% |
| C781 | 2113743E20 | CAP CHIP .10 UF 10% |
| C782 | 2113743E20 | CAP CHIP .10 UF 10% |
| C783 | 2113743E20 | CAP CHIP .10 UF 10% |

| | | |
|---|---|---|
| C784 | 2113743E20 | CAP CHIP .10 UF 10% |
| C785 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C786 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C787 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C789 | 2113743F16 | CAP CHIP 1.0  UF 16V +80-20% |
| C790 | 2113743N36 | CAP CHIP 27.0 PF 5% COG |
| C901 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C903 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C905 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C930 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C931 | 2311049A76 | CAP TANT CHIP 2.2UF 10% 6V |
| C98 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C99 | 2113743N07 | CAP CHIP 1.5 PF +-.25PF COG |
| CPL400 | 5885811G09 | CPLR CER MLTLYR 836MHZ 1608 |
| CPL681 | 5885811G10 | CPLR CER MLTLYR 991MHZ 1608 |
| CR2002 | 4809653F02 | RECT SCHOTTKY 1.0A UPS5817 |
| CR2020 | 4809924D09 | DIODE SCHTTKY DUAL MA742 SS |
| CR2200 | 4809653F02 | RECT SCHOTTKY 1.0A UPS5817 |
| CR2201 | 4809606E02 | DIODE DUAL ARRAY DAN222 |
| CR300 | 4809877C17 | DIODE VARACTOR MA4ST340 SOD323 |
| CR3100 | 4813830A70 | DIODE DL 5.6V COM ANODE |
| CR3101 | 4813830A70 | DIODE DL 5.6V COM ANODE |
| CR3500 | 4809948D15 | DI0DE DUAL TVS 12V SM12 SOT23 |
| CR3700 | 4813830A70 | DIODE DL 5.6V COM ANODE |
| CR400 | 4809606E05 | DIODE DUAL SCHOTTKEY SOT-143 |
| CR500 | 4862824C01 | DIODE VARACTOR |
| CR502 | 4809877C17 | DIODE VARACTOR MA4ST340 SOD323 |

| | | |
|---|---|---|
| CR700 | 4809606E03 | DIODE DUAL ARRAY DAP222 |
| CR800 | 4809606E08 | DIODE DUAL SCHOTTKEY RB715F |
| DS2401 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2402 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2403 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2404 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2405 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2406 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2407 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2408 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2409 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2410 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2411 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2412 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| FL12 | 9185783G06 | FLTR CER DP 800MHZ SMD MD158 |
| FL180 | 9109303U02 | FLTE CER LC 991MHZ 3225 SMD |
| FL200 | 9185646H08 | FLTR SAW IF 110MHZ 7X9MM SMD |
| FL202 | 9109142L03 | FLTR XTAL 109.65MHZ 5X7MM SMD |
| FL40 | 9103913K04 | FLTR SAW TX 881MHZ SMD |
| FL600 | 9103913K03 | FLTR SAW TX 836MHZ SMD |
| J10 | 0987378K01 | CONN RF MOD3 |
| J3200 | 0909059E01 | RECPT ZIF 16 POS SMD |
| J3400 | 0985882K01 | RECPT CHRG 3POSTN SMD |
| J3500 | 0987647K01 | CONN 2.5MM 2SW SMD |
| J3700 | 3909301S02 | CNTCT BATT PCB ZAPPA |
| J3701 | 3909301S02 | CNTCT BATT PCB ZAPPA |
| J3800 | 0985622G01 | SKT TOP ENTRY 2 POS |

| | | |
|---|---|---|
| L102 | 2409646M05 | IND CER MULTILYR 8.2NH 1608 |
| L11 | 2409646M78 | IN CER MULTILYR 5.6NH 1608 |
| L13 | 2409646M22 | IND CER MULTILYR 82 NH 1608 |
| L150 | 2409646M02 | IND CER MULTILYR 4.7NH 1608 |
| L151 | 2409646M70 | IND CER MULTILYR 56NH 1608 |
| L152 | 2409646M06 | IND CER MULTILYR 10NH 1608 |
| L180 | 2409154M15 | IND CER MLTILYR 15.0NH 1005 |
| L181 | 2404574Z11 | IND CHIP WW 150NH 2% 2012 SMD |
| L200 | 2404574Z08 | IND CHIP WW 82NH 2% 2012 SMD |
| L2000 | 2409092R09 | IND CHIP PWR 1008 15 UH SMD |
| L201 | 2485793G14 | IND CHIP WW 68 NH 2% 1608 SMD |
| L203 | 2404574Z13 | IND CHIP WW 220NH 2% 2012 SMD |
| L204 | 2404574Z13 | IND CHIP WW 220NH 2% 2012 SMD |
| L205 | 2413926D22 | IND 82.0 NH 10% |
| L300 | 2485793G10 | IND CHIP WW 33 NH 2% 1608 SMD |
| L330 | 2462587Q66 | IND CHIP 100,000 NH 10% |
| L430 | 2409414M33 | IND CHIP WW 5.6NH 10% 2012 SMD |
| L433 | 2409154M01 | IND CER MLTILYR 1.0NH 1005 |
| L434 | 2409154M31 | IND CER MLTILYR 3.9NH 1005 |
| L435 | 2409154M28 | IND CER MLTILYR 2.2NH 1005 |
| L501 | 2485793G08 | IND CHIP WW 22 NH 2% 1608 SMD |
| L601 | 2409154M80 | IND CER MLTILYR 2.2 NH 1005 |
| L604 | 2409154M96 | IND CER MLTILYR 47.0NH 1005 |
| L605 | 2409154M96 | IND CER MLTILYR 47.0NH 1005 |
| L606 | 2409154M17 | IND CER MLTILYR 22.0NH 1005 |
| L607 | 2113743N46 | CAP CHIP 68.0 PF 5% COG |
| L608 | 2409154M14 | IND CER MLTILYR 12.0NH 1005 |

| | | |
|---|---|---|
| L609 | 2409154M14 | IND CER MLTILYR 12.0NH 1005 |
| L610 | 2409154M96 | IND CER MLTILYR 47.0NH 1005 |
| L612 | 2409154M15 | IND CER MLTILYR 15.0NH 1005 |
| L622 | 2409154M10 | IND CER MLTILYR 5.6NH 1005 |
| L630 | 2409646M98 | IND CER MULTILYR 100NH 1608 |
| L676 | 2409646M11 | IND CER MULTILYR 27NH 1608 |
| L677 | 2409646M85 | IN CER MULTILYR 22 NH 1608 |
| L680 | 2409646M09 | IND CER MULTILYR 18NH 1608 |
| L728 | 2409646M73 | IND CER MULTILYR 100NH 1608 |
| L729 | 2409646M73 | IND CER MULTILYR 100NH 1608 |
| L777 | 2462587Q44 | IND CHIP 560 NH 10% |
| PCB | 8488720K01 | PCB SHARK CDMA SINGLE BAND |
| Q100 | 4809527E24 | TSTR NPN RF MRF949LT1 SC-90 |
| Q1170 | 4809579E40 | TSTR FET DUAL N/P FDG6320C SC7 |
| Q1176 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q150 | 4809527E33 | TSTR NPN RF MRF1047 SC70 |
| Q1930 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q200 | 4809940E01 | TSTR NPN MRF947 A/P |
| Q201 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q2204 | 4813824B11 | TSTR PNP 30V HI BETA |
| Q2206 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q2207 | 4809939C23 | TSTR DUAL NPN/NPN UM6 |
| Q2600 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q301 | 4809939C04 | TSTR DUAL PNP/NPN UMC3 |
| Q3300 | 4809807C37 | TSTR FET 3W P-CHN SI6969DQ TSO |
| Q350 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q430 | 4809579E29 | TSTR FET P-CHAN SI3443DV 6TSOP |

| | | |
|---|---|---|
| Q431 | 4809940E03 | TSTR DIG NPN DTC114TE |
| Q432 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q60 | 4809939C23 | TSTR DUAL NPN/NPN UM6 |
| Q601 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q61 | 4809939C23 | TSTR DUAL NPN/NPN UM6 |
| Q680 | 4809940E01 | |
| Q750 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q751 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q901 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q903 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q905 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q909 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| R100 | 0662057M52 | RES. CHIP 120 5% 20X40 |
| R101 | 0662057M66 | RES. CHIP 470 5% 20X40 |
| R103 | 0662057M14 | RES. CHIP 3.3 5% 20X40 |
| R110 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1110 | 0609591M37 | RES CHIP DUAL 10K 5% 0.63W |
| R1111 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1112 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1113 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1114 | 0609591M37 | RES CHIP DUAL 10K 5% 0.63W |
| R1115 | 0609591M37 | RES CHIP DUAL 10K 5% 0.63W |
| R1119 | 0662057M85 | RES. CHIP 3000 5% 20X40 |
| R1130 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R1141 | 0662057N31 | RES. CHIP 220K 5% 20X40 |
| R1142 | 0662057B46 | CHIP RES 10.0 MEG OHMS 5% |
| R1151 | 0662057U93 | RES CHIP 4.7K 1% 1/16W |

| | | |
|---|---|---|
| R1160 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1171 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1172 | 0662057N34 | RES. CHIP 300K 5% 20X40 |
| R1174 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1175 | 0662057N10 | RES. CHIP 30K 5% 20X40 |
| R1176 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1177 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1178 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1179 | 0662057M54 | RES. CHIP 150 5% 20X40 |
| R1182 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R150 | 0662057M58 | RES. CHIP 220 5% 20X40 |
| R151 | 0662057M34 | RES. CHIP 22 5% 20X40 |
| R152 | 0662057M58 | RES. CHIP 220 5% 20X40 |
| R153 | 0662057M61 | RES. CHIP 300 5% 20X40 |
| R154 | 0662057M61 | RES. CHIP 300 5% 20X40 |
| R155 | 0662057M32 | RES. CHIP 18 5% 20X40 |
| R180 | 0662057M40 | RES. CHIP 39 5% 20X40 |
| R181 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1910 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R1911 | 0662057N25 | RES. CHIP 120K 5% 20X40 |
| R1920 | 0662057N15 | RES. CHIP 47K 5% 20X40 |
| R1921 | 0662057N20 | RES. CHIP 75K 5% 20X40 |
| R1930 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R1931 | 0662057M88 | RES. CHIP 3900 5% 20X40 |
| R1932 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1940 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1941 | 0662057N19 | RES. CHIP 68K 5% 20X40 |

| | | |
|---|---|---|
| R1961 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R1990 | 0662057N13 | RES. CHIP 39K 5% 20X40 |
| R1991 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R1992 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1993 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R1994 | 0662057M95 | RES. CHIP 7500 5% 20X40 |
| R1995 | 0662057V07 | RES CHIP 15K 1% 1/16W |
| R1996 | 0662057V07 | RES CHIP 15K 1% 1/16W |
| R1997 | 0662057M95 | RES. CHIP 7500 5% 20X40 |
| R2009 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R201 | 0662057M70 | RES. CHIP 680 5% 20X40 |
| R2011 | 0662057M02 | RES. CHIP 1.0 5% 20X40 |
| R202 | 0662057M67 | RES. CHIP 510 5% 20X40 |
| R2021 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R2050 | 0662057N37 | RES. CHIP 390K 5% 20X40 |
| R2051 | 0662057N19 | RES. CHIP 68K 5% 20X40 |
| R2052 | 0662057N15 | RES. CHIP 47K 5% 20X40 |
| R206 | 0662057M70 | RES. CHIP 680 5% 20X40 |
| R2062 | 0662057M66 | RES. CHIP 470 5% 20X40 |
| R2063 | 0662057M58 | RES. CHIP 220 5% 20X40 |
| R207 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R208 | 0662057M67 | RES. CHIP 510 5% 20X40 |
| R2081 | 0662057N11 | RES. CHIP 33K 5% 20X40 |
| R2082 | 0662057N09 | RES. CHIP 27K 5% 20X40 |
| R2083 | 0662057N09 | RES. CHIP 27K 5% 20X40 |
| R2085 | 0662057M32 | RES. CHIP 18 5% 20X40 |
| R209 | 0662057N23 | RES. CHIP 100K 5% 20X40 |

| | | |
|---|---|---|
| R210 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R2200 | 0680195M64 | RES 0.24 OHM 1/2W |
| R2205 | 0662057M60 | RES. CHIP 270 5% 20X40 |
| R2207 | 0662057N37 | RES. CHIP 390K 5% 20X40 |
| R2208 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R2209 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R2210 | 0662057N39 | RES. CHIP 470K 5% 20X40 |
| R2212 | 0662057N19 | RES. CHIP 68K 5% 20X40 |
| R2401 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2402 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2403 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2404 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2405 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2406 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2407 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2408 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2409 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2410 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2411 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2412 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2601 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2602 | 0662057N27 | RES. CHIP 150K 5% 20X40 |
| R2603 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R300 | 0662057M86 | RES. CHIP 3300 5% 20X40 |
| R301 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R302 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R303 | 0662057M80 | RES. CHIP 1800 5% 20X40 |

| | | |
|---|---|---|
| R3200 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R3201 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R3202 | 0609591M17 | RES CHIP DUAL 220 5% .63W |
| R3203 | 0609591M17 | RES CHIP DUAL 220 5% .63W |
| R3204 | 0609591M17 | RES CHIP DUAL 220 5% .63W |
| R3205 | 0609591M17 | RES CHIP DUAL 220 5% .63W |
| R3206 | 0609591M17 | RES CHIP DUAL 220 5% .63W |
| R3301 | 0662057V19 | RES CHIP 47K 1% 1/16W |
| R3302 | 0662057V02 | RES CHIP 10K 1% 1/16W |
| R331 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R332 | 0662057M84 | RES. CHIP 2700 5% 20X40 |
| R333 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R3400 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R3401 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R3402 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R3403 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R351 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R401 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R402 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R403 | 0662057N25 | RES. CHIP 120K 5% 20X40 |
| R404 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R405 | 0662057M95 | RES. CHIP 7500 5% 20X40 |
| R406 | 0662057N09 | RES. CHIP 27K 5% 20X40 |
| R430 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R431 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R432 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R434 | 0662057N23 | RES. CHIP 100K 5% 20X40 |

| | | |
|---|---|---|
| R435 | 0662057M46 | RES. CHIP 68 5% 20X40 |
| R436 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R500 | 0662057N05 | RES. CHIP 18K 5% 20X40 |
| R501 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R502 | 0662057M78 | RES. CHIP 1500 5% 20X40 |
| R503 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R504 | 0662057M82 | RES. CHIP 2200 5% 20X40 |
| R60 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R605 | 0662057N23 | RES. CHIP 100K 5% 20X40 |
| R607 | 0662057N13 | RES. CHIP 39K 5% 20X40 |
| R61 | 0662057N33 | RES. CHIP 270K 5% 20X40 |
| R615 | 0662057N06 | RES. CHIP 20K 5% 20X40 |
| R617 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R62 | 0662057N25 | RES. CHIP 120K 5% 20X40 |
| R63 | 0662057N19 | RES. CHIP 68K 5% 20X40 |
| R64 | 0662057N07 | RES. CHIP 22K 5% 20X40 |
| R65 | 0662057N13 | RES. CHIP 39K 5% 20X40 |
| R670 | 0662057M60 | RES. CHIP 270 5% 20X40 |
| R671 | 0662057M46 | RES. CHIP 68 5% 20X40 |
| R672 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R683 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R684 | 0662057M19 | RES. CHIP 5.1 5% 20X40 |
| R685 | 0662057M52 | RES. CHIP 120 5% 20X40 |
| R686 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R687 | 0662057M52 | RES. CHIP 120 5% 20X40 |
| R688 | 0662057M86 | RES. CHIP 3300 5% 20X40 |
| R689 | 0662057M84 | RES. CHIP 2700 5% 20X40 |

| | | |
|---|---|---|
| R690 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R700 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R701 | 2113743N46 | CAP CHIP 68.0 PF 5% COG |
| R703 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R707 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R709 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R728 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R729 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R730 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R731 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R732 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R734 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R752 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R800 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R801 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R902 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R903 | 0662057N23 | RES. CHIP 100K 5% 20X40 |
| R904 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R906 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R907 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R930 | 0662057N33 | RES. CHIP 270K 5% 20X40 |
| S3120 | 4009368L01 | SW TACTILE RT ANGL SMD |
| S3121 | 4009368L01 | SW TACTILE RT ANGL SMD |
| S3122 | 4009368L01 | SW TACTILE RT ANGL SMD |
| SH1 | 2688276K01 | CDMA ZIFSIN SHIELD |
| SH2 | 2689795K01 | SHIELD TXCO SHARK CDMA SB |
| SH3 | 2689118K01 | SHIELD RCVR SHARK |

| | | |
|---|---|---|
| SH4 | 2689120K02 | SHIELD SHARK CDMA SB TX |
| SH5 | 2689119K01 | SHIELD CCAP SHARK |
| SH6 | 2688277K02 | SHIELD SHARK CDMA LOGIC IC |
| SH7 | 2689117K01 | SHIELD VCO SHARK |
| TM3300 | 0687802K01 | THERM NTC 50K 1% 3950K 2012 |
| U100 | 5109572E26 | IC GAAS RF SW SPDT AS139 |
| U101 | 5109781E91 | IC LV BIAS STAB/ENN MDC5001T1 |
| U1200 | 5199422A01 | IC FLASH 16MB GT28F160C3BA90 |
| U1201 | 5109522E24 | IC SNGL OR GATE TC7SH32FU |
| U1203 | 5109522E23 | IC SNGL INV GATE TC7SH04FU |
| U1300 | 5189334K01 | 2MEG SRAM |
| U150 | 5109781E91 | IC LV BIAS STAB/ENN MDC5001T1 |
| U151 | 5109572E26 | IC GAAS RF SW SPDT AS139 |
| U180 | 5109940K28 | IC MMIC GAAS MXR W/IF TQ5M31 |
| U1800 | 5109632D99 | IC CUST PAC MAX511EEE 16QSOP |
| U1900 | 5109923D36 | IC CUST CIA SC29100GRC2 J21K |
| U200 | 5109572E37 | IC GAAS SPDT SW SOT-363 |
| U2000 | 5109879E65 | IC BICMOS CCAP LITE 1.8V 48QFP |
| U2020 | 5109781E78 | IC NEG LDO REG ILC7362 23SOT |
| U2200 | 5109923D46 | TSTR CUST COVIC MSOP-8 |
| U2400 | 5109512F17 | IC VOLT REG MC33263NW-28R2 SOT |
| U430 | 5109730C32 | MMIC RF PA CMM 0530 LC 00BT |
| U600 | 5109940K29 | IC MIX/EXC CDMA/AMPS ME3 32BCC |
| U680 | 4809283D18 | OSC MOD VCO 991MHZ SMD CDMA |
| U700 | 5109879E19 | IC BICMOS ZIF/SYNTH SC79836GC |
| U831 | 5109768D06 | IC TEMP SNSR LM60CIM3X SOT23 |
| U901 | 5109522E24 | IC SNGL OR GATE TC7SH32FU |

| | | |
|---|---|---|
| U930 | 5109512F17 | IC VOLT REG MC33263NW-28R2 SOT |
| VR3400 | 4813833B10 | DIODE SCHOTTKY .5A 30V |
| VR3600 | 4809788E06 | DIODE ZENER 6.8V UDZ6.8B |
| VR3601 | 4809788E08 | DIODE ZENER 8.2V UDZTE178.2B |
| VR800 | 4813830A73 | DIODE 2.7V 5% 225MW |
| Y1140 | 4809995L09 | XTAL QUARTZ 32.768KHZ MC-146 |
| | 2409646M93 | IN CER MULTILYR 3.3NH 1608 |
| | 3989579K02 | CONT LOWER ANT |
| | 5199477A01 | IC BICMOS CASPER 224 PBGA |
| | 2311049A62 | CAP TAN CHIP A/P 4.7 10 10 |
| | 4809863M17 | OSC MOD REF 16.8MHZ 5032 SMD |

**MECHANICAL PARTS LIST**

**SUG1739AA**

**XCVR SHARK CDMA DB V. BLK**

| PART # | DESCRIPTION |
|---|---|
| 5488547K01 | LBL MFG MA SHARK |
| SHN7278A | H&H GENERIC MOD3 |
| 0585977K01 | GROMMET RF MOD3 |
| 4085941K01 | SW ARRAY MYLAR DOMES MOD3 |
| 5009005J07 | ALERT MAG 12MM LF SPRNG CNTCT |
| 5009076E25 | SPEAKER, 20 MM DYN SHARK |
| 5009135L07 | MIC ELECT 6MM PINS |
| SHN7545A | H&H CUSTOM LK R CDMA |
| 0309315B07 | SCREW TORX PLUS W/AUTOSER 1.8 |
| 0309315B11 | SCR METRIC PT THREAD FORMING |
| 1587934K05 | HSNG FRNT ASSY V. GNMTL BLK |
| 1587958K01 | HSNG REAR ASSY SHARK T/CDMA DB |
| 3288019K01 | SIDE BUTTON LH VOLUME |
| 3288020K01 | SIDE BUTTON RH W/SMART |
| 3888018K23 | KYPD SHARK V. CDMA GENERIC |
| 6188017K01 | LENS LKR M3 |
| 7288454K02 | ASSY DISPLAY MOD SHARK |
| 8588448K01 | ANT 3/8L 33MM |
| SYN8212B | XCVR MOD3 DB XCVR BD C841 PA |

| | | |
|---|---|---|
| A1 | 3989033K01 | CONT ANT SHARK |
| C100 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C102 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C103 | 2113743N54 | CAP CHIP 150 PF 5% COG |
| C104 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C105 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C106 | 2113743N58 | CAP CHIP 4.0PF 16V .25PF COG |
| C1060 | 2113743G26 | CAP CHIP 4.7 UF 16V +80-20% |
| C1061 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C107 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C108 | 2113743N36 | CAP CHIP 27.0 PF 5% COG |
| C109 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C110 | 2113928N01 | CAP CER CHIP 0.1UF 10% 6.3 |
| C1100 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1101 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1102 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1103 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1104 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1105 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1107 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1108 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1109 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1131 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1132 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1141 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C1142 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| C1152 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |

| | | |
|---|---|---|
| C1153 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1154 | 2113741F49 | CAP CHIP CL2 X7R REEL 10000 |
| C1170 | 2113928N01 | CAP CER CHIP 0.1UF 10% 6.3 |
| C1171 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C12 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |
| C120 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1200 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1201 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C121 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C122 | 2113743N34 | CAP CHIP 22.0 PF 5% COG |
| C124 | 2113743N54 | CAP CHIP 150 PF 5% COG |
| C13 | 2113743N01 | CAP CHIP 0.5 PF +-.25PF COG |
| C1300 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C13311 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C1800 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1801 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1802 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1900 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1901 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1910 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1911 | 2113741F13 | CAP CHIP CL2 X7R REEL 330 |
| C1912 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C1920 | 2113741F25 | CAP CHIP CL2 X7R REEL 1000 |
| C1921 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1930 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C1940 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1941 | 2113741F23 | CAP CHIP CL2 X7R REEL 820 |

| | | |
|---|---|---|
| C1950 | 2113743K15 | CER CHIP CAP .100UF |
| C1951 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1952 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1953 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1954 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1960 | 2113741F33 | CAP CHIP CL2 X7R REEL 2200 |
| C1961 | 2113743E10 | CAP CHIP .033 UF 10% X7R |
| C1962 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1990 | 2113743M08 | CAP CHIP 22000 PF +80-20% Y5V |
| C1991 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1992 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1993 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1994 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C20 | 2113743N64 | CAP CHIP 7.0PF 16V .5PF COG |
| C2000 | 2311049A57 | CAP TANT CHIP A/P 10UF 10% 16V |
| C2001 | 2113743E20 | CAP CHIP .10 UF 10% |
| C2002 | 2311049A89 | CAP TANT CHIP 22 UF 4V 10% |
| C2004 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2006 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2009 | 2113928A01 | CAP CER CHIP 1.0 UF 10V |
| C201 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2010 | 2309121D19 | CAP CHIP TANT 10 UF 10% 10 V |
| C2011 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2012 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C2018 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C2019 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C202 | 2113743N13 | CAP CHIP 3.0 PF +-.25PF COG |

| | | |
|---|---|---|
| C2020 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2021 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2022 | 2113928C03 | CAP CER CHIP 1.0 UF 6.3V 10% |
| C204 | 2113743N67 | CAP CHIP 9.0PF 16V .5PF COG |
| C2044 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2050 | 2113743E03 | CER CHIP CAP .015UF |
| C1802 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1900 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1901 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1910 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1911 | 2113741F13 | CAP CHIP CL2 X7R REEL 330 |
| C1912 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C1920 | 2113741F25 | CAP CHIP CL2 X7R REEL 1000 |
| C1921 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1930 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C1940 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1941 | 2113741F23 | CAP CHIP CL2 X7R REEL 820 |
| C1950 | 2113743K15 | CER CHIP CAP .100UF |
| C1951 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1952 | 2113743E20 | CAP CHIP .10 UF 10% |
| C1953 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1954 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1960 | 2113741F33 | CAP CHIP CL2 X7R REEL 2200 |
| C1961 | 2113743E10 | CAP CHIP .033 UF 10% X7R |
| C1962 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C1990 | 2113743M08 | CAP CHIP 22000 PF +80-20% Y5V |
| C1991 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |

| | | |
|---|---|---|
| C1992 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1993 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C1994 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C20 | 2113743N64 | CAP CHIP 7.0PF 16V .5PF COG |
| C2000 | 2311049A57 | CAP TANT CHIP A/P 10UF 10% 16V |
| C2001 | 2113743E20 | CAP CHIP .10 UF 10% |
| C2002 | 2311049A89 | CAP TANT CHIP 22 UF 4V 10% |
| C2004 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2006 | 2185736G01 | CAP CER Y5V 22UF 10V 3225 SMD |
| C2009 | 2113928A01 | CAP CER CHIP 1.0 UF 10V |
| C201 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2010 | 2309121D19 | CAP CHIP TANT 10 UF 10% 10 V |
| C2011 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2012 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C2018 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C2019 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C202 | 2113743N13 | CAP CHIP 3.0 PF +-.25PF COG |
| C2020 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2021 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C2022 | 2113928C03 | CAP CER CHIP 1.0 UF 6.3V 10% |
| C204 | 2113743N67 | CAP CHIP 9.0PF 16V .5PF COG |
| C2044 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C2050 | 2113743E03 | CER CHIP CAP .015UF |
| C332 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C3401 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C3500 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C3501 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |

| | | |
|---|---|---|
| C351 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C352 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C3700 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C3701 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C40 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C402 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C403 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C405 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |
| C41 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C42 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C43 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C430 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C432 | 2113743N42 | CAP CHIP 47.0 PF 5% COG |
| C433 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C434 | 2113743N46 | CAP CHIP 68.0 PF 5% COG |
| C437 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C438 | 2113928C04 | CAP CER CHIP 4.7UF 6.3V10%0805 |
| C44 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C440 | 2113928P04 | CAP CER CHIP 1.0UF 20% 6.3V |
| C442 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C443 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C444 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C445 | 2113740F25 | CAP CHIP REEL CL1 +/-30 8.2 |
| C446 | 2113743N58 | CAP CHIP 4.0PF 16V .25PF COG |
| C45 | 2113743N65 | CAP CHIP 8.0PF 16V .5PF COG |
| C500 | 2113928C03 | CAP CER CHIP 1.0 UF 6.3V 10% |
| C501 | 2113743N16 | CAP CHIP 3.9 PF +-.25PF COG |

| | | |
|---|---|---|
| C502 | 2113743N24 | CAP CHIP 8.2 PF + -.5PF COG |
| C503 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C504 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |
| C505 | 2113743N07 | CAP CHIP 1.5 PF +-.25PF COG |
| C506 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C507 | 2113743E12 | CAP CHIP .047 UF 10% X7R |
| C508 | 2311049B08 | CAP TANT CHIP 1.0 UF 10V 10% |
| C509 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C510 | 2113743N09 | CAP CHIP 2.0 PF +-.25PF COG |
| C511 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C512 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C514 | 2113743N38 | CAP CHIP 33.0 PF 5% COG |
| C600 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C601 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C602 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C604 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C605 | 2113743N10 | CAP CHIP 2.2 PF +-.25PF COG |
| C608 | 2113743N26 | CAP CHIP 10.0 PF 5% COG |
| C616 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C617 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C618 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C621 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C622 | 2113743N58 | CAP CHIP 4.0PF 16V .25PF COG |
| C623 | 2113743N08 | CAP CHIP 1.6 PF +-.25PF COG |
| C624 | 2409154M15 | IND CER MLTILYR 15.0NH 1005 |
| C625 | 2113743N14 | CAP CHIP 3.3 PF +-.25PF COG |
| C626 | 2113743N10 | CAP CHIP 2.2 PF +-.25PF COG |

| | | |
|---|---|---|
| C627 | 2113743N10 | CAP CHIP 2.2 PF +-.25PF COG |
| C628 | 2113743N14 | CAP CHIP 3.3 PF +-.25PF COG |
| C629 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C632 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C635 | 2113743N36 | CAP CHIP 27.0 PF 5% COG |
| C636 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C637 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C670 | 2113743A23 | CAP CHIP .220 UF 10% X7R |
| C671 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C672 | 2113743L25 | CAP CHIP 2200 PF 10% X7R |
| C676 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C677 | 2113743N18 | CAP CHIP 4.7 PF +-.25PF COG |
| C678 | 2113743N16 | CAP CHIP 3.9 PF +-.25PF COG |
| C679 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C680 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C681 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C682 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C684 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C685 | 2311049A76 | CAP TANT CHIP 2.2UF 10% 6V |
| C688 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C689 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C690 | 2113743N12 | CAP CHIP 2.7 PF +-.25PF COG |
| C700 | 2113743E20 | CAP CHIP .10 UF 10% |
| C701 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C703 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C704 | 2113743E20 | CAP CHIP .10 UF 10% |
| C705 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |

| | | |
|---|---|---|
| C706 | 2113743E20 | CAP CHIP .10 UF 10% |
| C707 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C708 | 2311049B08 | CAP TANT CHIP 1.0 UF 10V 10% |
| C709 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C721 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C723 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C724 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C730 | 2113743L01 | CAP CHIP 220 PF 10% X7R |
| C731 | 2113743L01 | CAP CHIP 220 PF 10% X7R |
| C732 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C733 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C740 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C741 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C750 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C751 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C752 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C753 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C754 | 2113743L21 | CAP CHIP 1500 PF 10% X7R |
| C755 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C756 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C775 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |
| C776 | 2113928N01 | CAP CER CHIP 0.1UF 10% 6.3 |
| C777 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C778 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C779 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C780 | 2113743E20 | CAP CHIP .10 UF 10% |
| C781 | 2113743E20 | CAP CHIP .10 UF 10% |

| | | |
|---|---|---|
| C782 | 2113743E20 | CAP CHIP .10 UF 10% |
| C783 | 2113743E20 | CAP CHIP .10 UF 10% |
| C784 | 2113743E20 | CAP CHIP .10 UF 10% |
| C785 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C786 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C787 | 2113743N40 | CAP CHIP 39.0 PF 5% COG |
| C789 | 2113743F16 | CAP CHIP 1.0 UF 16V +80-20% |
| C790 | 2113743N36 | CAP CHIP 27.0 PF 5% COG |
| C834 | 2113743L33 | CAP CHIP 4700 PF 10% X7R |
| C835 | 2113740F15 | CAP CHIP REEL CL1 +/-30 3.3 |
| C836 | 2113740F03 | CAP CHIP REEL CL1 +/-30 1.0 |
| C837 | 2113743N54 | CAP CHIP 150 PF 5% COG |
| C838 | 2113743L41 | CAP CHIP 10000 PF 10% X7R |
| C839 | 2113743N46 | CAP CHIP 68.0 PF 5% COG |
| C840 | 2113743L35 | CAP CHIP 5600 PF 10% X7R |
| C841 | 2113740F21 | CAP CHIP REEL CL1 +/-30 5.6 |
| C842 | 2113928P04 | CAP CER CHIP 1.0UF 20% 6.3V |
| C843 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C844 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C845 | 2113743N50 | CAP CHIP 100 PF 5% COG |
| C846 | 2113743N28 | CAP CHIP 12.0 PF 5% COG |
| C848 | 2409154M01 | IND CER MLTILYR 1.0NH 1005 |
| C900 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C901 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C903 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C905 | 2113743M24 | CAP CHIP 100000 PF +80-20% Y5V |
| C930 | 2113743L17 | CAP CHIP 1000 PF 10% X7R |

| | | |
|---|---|---|
| C931 | 2311049A76 | CAP TANT CHIP 2.2UF 10% 6V |
| CPL400 | 5885811G09 | CPLR CER MLTLYR 836MHZ 1608 |
| CPL510 | 5885811G07 | CPLR CER MLTLYR 1880MHZ 1608 |
| CPL680 | 5885811G08 | CPLR CER MLTLYR 2070MHZ 1608 |
| CPL681 | 5885811G10 | CPLR CER MLTLYR 991MHZ 1608 |
| CR1060 | 4809606E02 | DIODE DUAL ARRAY DAN222 |
| CR20 | 4809948D22 | DIODE PIN BAR65-02W SCD-80 |
| CR2002 | 4809653F02 | RECT SCHOTTKY 1.0A UPS5817 |
| CR2020 | 4809924D09 | DIODE SCHTTKY DUAL MA742 SS |
| CR2200 | 4809653F02 | RECT SCHOTTKY 1.0A UPS5817 |
| CR2201 | 4809606E02 | DIODE DUAL ARRAY DAN222 |
| CR300 | 4809877C17 | DIODE VARACTOR MA4ST340 SOD323 |
| CR3100 | 4813830A70 | DIODE DL 5.6V COM ANODE |
| CR3101 | 4813830A70 | DIODE DL 5.6V COM ANODE |
| CR3500 | 4809948D15 | DI0DE DUAL TVS 12V SM12 SOT23 |
| CR3700 | 4813830A70 | DIODE DL 5.6V COM ANODE |
| CR40 | 4809948D22 | DIODE PIN BAR65-02W SCD-80 |
| CR400 | 4809606E05 | DIODE DUAL SCHOTTKEY SOT-143 |
| CR500 | 4862824C01 | DIODE VARACTOR |
| CR501 | 4809948D10 | DIODE PIN BAR63-03 |
| CR502 | 4809877C21 | DIODE HYPERABRUPT VARACTOR |
| CR700 | 4809606E03 | DIODE DUAL ARRAY DAP222 |
| CR800 | 4809606E08 | DIODE DUAL SCHOTTKEY RB715F |
| DS2401 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2402 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2403 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2404 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |

| | | |
|---|---|---|
| DS2405 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2406 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2407 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2408 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2409 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2410 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2411 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| DS2412 | 4809496B11 | LED CHIP YEL-GRN 1608 CL191YG |
| FL10 | 9185783G05 | FLTR CER DP 1900MHZ SMD MD152 |
| FL12 | 9185783G06 | FLTR CER DP 800MHZ SMD MD158 |
| FL120 | 9109303U02 | FLTE CER LC 991MHZ 3225 SMD |
| FL13 | 9185906G09 | FLTR CER DIPLX 859/1230 2012 |
| FL20 | 9185807G03 | FLTR CER RX-LO COMBO 1.9GHZ |
| FL200 | 9185646H07 | FLTR SAW IF 110MHZ 7X9MM SMD |
| FL201 | 9185838J01 | FLTR XTAL 109.65MHZ 3.8MM SMD |
| FL40 | 9103913K02 | FLTR SAW TX 881MHZ SMD |
| FL600 | 9103913K03 | FLTR SAW TX 836MHZ SMD |
| FL601 | 9185782G03 | FLTR CER TX 1800/1900MHZ SMD |
| FL602 | 9103914K04 | FLTR CER LC BP 172.3MHZ 4532 |
| FL603 | 9109069E06 | FLTR SAW BP 1880MHZ 3X3MM SMD |
| FL604 | 5885758J01 | BALUN CHIP 1.8-2.0GHZ 2012 SMD |
| J10 | 0987378K01 | CONN RF MOD3 |
| J3200 | 0909059E01 | RECPT ZIF 16 POS SMD |
| J3400 | 0985882K01 | RECPT CHRG 3POSTN SMD |
| J3500 | 0987647K01 | CONN 2.5MM 2SW SMD |
| J3700 | 3909301S02 | CNTCT BATT PCB ZAPPA |
| J3701 | 3909301S02 | CNTCT BATT PCB ZAPPA |

| | | |
|---|---|---|
| J3800 | 0985622G01 | SKT TOP ENTRY 2 POS |
| L10 | 2409154M85 | IND CER MLTILYR 5.6 NH 1005 |
| L10 | 2409154M10 | IND CER MLTILYR 5.6NH 1005 |
| L100 | 2409154M37 | IND CER MLTILYR 12.0NH 1005 |
| L101 | 2409646M22 | IND CER MULTILYR 82 NH 1608 |
| L11 | 2409154M58 | IND CER MTLILYR 3.9 NH 1005 |
| L120 | 2409154M15 | IND CER MLTILYR 15.0NH 1005 |
| L121 | 2413926D26 | IND CER CHIP 180.0 NH 10% |
| L20 | 2409154M05 | IND CER MLTILYR 2.2NH 1005 |
| L200 | 2485793G15 | IND CHIP WW 82 NH 2% 1608 SMD |
| L2000 | 2409092R09 | IND CHIP PWR 1008 15 UH SMD |
| L201 | 2485793G13 | IND CHIP WW 56 NH 2% 1608 SMD |
| L2017 | 2462587V36 | CHIP IND 150 NH 5% 0805 |
| L203 | 2413926D29 | IND CER CHIP 330.0 NH 10% |
| L204 | 2413926D29 | IND CER CHIP 330.0 NH 10% |
| L205 | 2413926D22 | IND 82.0 NH 10% |
| L21 | 2409154M19 | IND CER MLTILYR 33.0NH 1005 |
| L22 | 2409154M10 | IND CER MLTILYR 5.6NH 1005 |
| L24 | 2409154M07 | IND CER MLTILYR 3.3NH 1005 |
| L300 | 2485793G10 | IND CHIP WW 33 NH 2% 1608 SMD |
| L330 | 2462587Q66 | IND CHIP 100,000 NH 10% |
| L40 | 2409154M14 | IND CER MLTILYR 12.0NH 1005 |
| L41 | 2409154M05 | IND CER MLTILYR 2.2NH 1005 |
| L43 | 2409154M64 | IND CER MTLILYR 12.0NH 1005 |
| L430 | 2462587V24 | CHIP IND 15 NH 5% 0805 |
| L433 | 2409154M01 | IND CER MLTILYR 1.0NH 1005 |
| L434 | 2409154M07 | IND CER MLTILYR 3.3NH 1005 |

| | | |
|---|---|---|
| L439 | 2409154M11 | IND CER MLTILYR 6.8NH 1005 |
| L500 | 2485793G12 | IND CHIP WW 47 NH 2% 1608 SMD |
| L501 | 2485793G07 | IND CHIP WW 18 NH 2% 1608 SMD |
| L502 | 2413926D29 | IND CER CHIP 330.0 NH 10% |
| L511 | 2409154M09 | IND CER MLTILYR 4.7NH 1005 |
| L604 | 2409154M96 | IND CER MLTILYR 47.0NH 1005 |
| L605 | 2409154M96 | IND CER MLTILYR 47.0NH 1005 |
| L607 | 2113743N46 | CAP CHIP 68.0 PF 5% COG |
| L608 | 2409154M14 | IND CER MLTILYR 12.0NH 1005 |
| L609 | 2409154M14 | IND CER MLTILYR 12.0NH 1005 |
| L610 | 2409154M96 | IND CER MLTILYR 47.0NH 1005 |
| L611 | 2409154M09 | IND CER MLTILYR 4.7NH 1005 |
| L612 | 2409154M15 | IND CER MLTILYR 15.0NH 1005 |
| L613 | 2409154M01 | IND CER MLTILYR 1.0NH 1005 |
| L614 | 2409154M19 | IND CER MLTILYR 33.0NH 1005 |
| l620 | 2409154M19 | IND CER MLTILYR 33.0NH 1005 |
| L621 | 2409154M01 | IND CER MLTILYR 1.0NH 1005 |
| L622 | 2409154M10 | IND CER MLTILYR 5.6NH 1005 |
| L623 | 2409154M10 | IND CER MLTILYR 5.6NH 1005 |
| L676 | 2409646M11 | IND CER MULTILYR 27NH 1608 |
| L728 | 2409646M73 | IND CER MULTILYR 100NH 1608 |
| L729 | 2409646M73 | IND CER MULTILYR 100NH 1608 |
| L777 | 2462587Q44 | IND CHIP 560 NH 10% |
| L831 | 2113743N30 | CAP CHIP 15.0 PF 5% COG |
| L832 | 2409646M97 | IN CER MULTILYR |
| L833 | 2409646M97 | IN CER MULTILYR |
| Q100 | 4809527E20 | TSTR NPN RF 2SC4784 SC70 |

| | | |
|---|---|---|
| Q1060 | 4809579E40 | TSTR FET DUAL N/P FDG6320C SC7 |
| Q1170 | 4809579E40 | TSTR FET DUAL N/P FDG6320C SC7 |
| Q1176 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q1930 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q20 | 4809527E18 | TSTR NPN RF BFP420 |
| Q200 | 4809940E01 | TSTR NPN MRF947 A/P |
| Q201 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q2204 | 4813824B11 | TSTR PNP 30V HI BETA |
| Q2206 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q2207 | 4809939C23 | TSTR DUAL NPN/NPN UM6 |
| Q2600 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q301 | 4809939C04 | TSTR DUAL PNP/NPN UMC3 |
| Q3300 | 4809807C37 | TSTR FET 3W P-CHN SI6969DQ TSO |
| Q350 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q352 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q40 | 4809527E24 | TSTR NPN RF MRF949LT1 SC-90 |
| Q430 | 4809579E29 | TSTR FET P-CHAN SI3443DV 6TSOP |
| Q431 | 4809940E03 | TSTR DIG NPN DTC114TE |
| Q432 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q500 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q601 | 4809608E03 | TSTR DIG PNP DTA114YE |
| Q690 | 4809579E42 | FET DUAL P-CHAN FDG6304P SC70 |
| Q750 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q751 | 4809579E02 | TSTR MOSFET N-CHAN 25K1830 |
| Q900 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q901 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| Q903 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |

| | | |
|---|---|---|
| Q905 | 4809579E12 | TSTR MOSFET P-CHAN ML6302 |
| R100 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R101 | 0662057M91 | RES. CHIP 5100 5% 20X40 |
| R102 | 0662057M44 | RES. CHIP 56 5% 20X40 |
| R1060 | 0660076N25 | RES CHIP 100 OHM 1/16 W |
| R1061 | 0662057N47 | RES. CHIP 1.0 MEG 5% 20X40 |
| R1062 | 0662057M33 | RES. CHIP 20 5% 20X40 |
| R1100 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1101 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1110 | 0609591M37 | RES CHIP DUAL 10K 5% 0.63W |
| R1111 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1112 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1113 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1114 | 0609591M37 | RES CHIP DUAL 10K 5% 0.63W |
| R1115 | 0609591M37 | RES CHIP DUAL 10K 5% 0.63W |
| R1119 | 0662057M85 | RES. CHIP 3000 5% 20X40 |
| R1130 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R1141 | 0662057N31 | RES. CHIP 220K 5% 20X40 |
| R1142 | 0662057B46 | CHIP RES 10.0 MEG OHMS 5% |
| R1151 | 0662057U93 | RES CHIP 4.7K 1% 1/16W |
| R1160 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1171 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1172 | 0662057N34 | RES. CHIP 300K 5% 20X40 |
| R1174 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1175 | 0662057N10 | RES. CHIP 30K 5% 20X40 |
| R1176 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1177 | 0662057M98 | RES. CHIP 10K 5% 20X40 |

| | | |
|---|---|---|
| R1178 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R1179 | 0662057M54 | RES. CHIP 150 5% 20X40 |
| R1181 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1182 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R120 | 0662057M46 | RES. CHIP 68 5% 20X40 |
| R1900 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1901 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R1910 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R1911 | 0662057N25 | RES. CHIP 120K 5% 20X40 |
| R1920 | 0662057N15 | RES. CHIP 47K 5% 20X40 |
| R1921 | 0662057N20 | RES. CHIP 75K 5% 20X40 |
| R1930 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R1931 | 0662057M88 | RES. CHIP 3900 5% 20X40 |
| R1932 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1940 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1941 | 0662057N19 | RES. CHIP 68K 5% 20X40 |
| R1961 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R1990 | 0662057N13 | RES. CHIP 39K 5% 20X40 |
| R1991 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R1992 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R1993 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R1994 | 0662057M95 | RES. CHIP 7500 5% 20X40 |
| R1995 | 0662057V07 | RES CHIP 15K 1% 1/16W |
| R1996 | 0662057V07 | RES CHIP 15K 1% 1/16W |
| R1997 | 0662057M95 | RES. CHIP 7500 5% 20X40 |
| R20 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R2001 | 0662057M01 | RES. CHIP 0 5% 20X40 |

| | | |
|---|---|---|
| R2002 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R2003 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R2009 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R201 | 0662057M70 | RES. CHIP 680 5% 20X40 |
| R2011 | 0662057M02 | RES. CHIP 1.0 5% 20X40 |
| R202 | 0662057M67 | RES. CHIP 510 5% 20X40 |
| R2021 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R203 | 0662057M67 | RES. CHIP 510 5% 20X40 |
| R2050 | 0662057N37 | RES. CHIP 390K 5% 20X40 |
| R2051 | 0662057N19 | RES. CHIP 68K 5% 20X40 |
| R2052 | 0662057N15 | RES. CHIP 47K 5% 20X40 |
| R206 | 0662057M70 | RES. CHIP 680 5% 20X40 |
| R2062 | 0662057M66 | RES. CHIP 470 5% 20X40 |
| R2063 | 0662057M58 | RES. CHIP 220 5% 20X40 |
| R207 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R2081 | 662057N11 | RES. CHIP 33K 5% 20X40 |
| R2082 | 0662057N09 | RES. CHIP 27K 5% 20X40 |
| R2083 | 0662057N09 | RES. CHIP 27K 5% 20X40 |
| R2085 | 0662057M32 | RES. CHIP 18 5% 20X40 |
| R209 | 0662057N23 | RES. CHIP 100K 5% 20X40 |
| R22 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R2200 | 0680195M64 | RES 0.24 OHM 1/2W |
| R2205 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R2207 | 0662057N37 | RES. CHIP 390K 5% 20X40 |
| R2208 | 0662057V02 | RES CHIP 10K 1% 1/16W |
| R2209 | 0662057V02 | RES CHIP 10K 1% 1/16W |
| R2210 | 0662057N39 | RES. CHIP 470K 5% 20X40 |

| | | |
|---|---|---|
| R2212 | 0662057N19 | RES. CHIP 68K 5% 20X40 |
| R23 | 0662057M28 | RES. CHIP 12 5% 20X40 |
| R2400 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R2401 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2402 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2403 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2404 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2405 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2406 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2407 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2408 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2409 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2410 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2411 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2412 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2601 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R2602 | 0662057N27 | RES. CHIP 150K 5% 20X40 |
| R2603 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R300 | 0662057M86 | RES. CHIP 3300 5% 20X40 |
| R301 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R302 | 0662057M74 | RES. CHIP 1000 5% 20X40 |
| R303 | 0662057M80 | RES. CHIP 1800 5% 20X40 |
| R3201 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R3301 | 0662057V19 | RES CHIP 47K 1% 1/16W |
| R3302 | 0662057V02 | RES CHIP 10K 1% 1/16W |
| R331 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R332 | 0662057M84 | RES. CHIP 2700 5% 20X40 |

| | | |
|---|---|---|
| R333 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R3400 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R3401 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R3402 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R3403 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R40 | 0662057N07 | RES. CHIP 22K 5% 20X40 |
| R401 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R402 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R403 | 0662057N17 | RES. CHIP 56K 5% 20X40 |
| R404 | 0662057M90 | RES. CHIP 4700 5% 20X40 |
| R405 | 0662057M95 | RES. CHIP 7500 5% 20X40 |
| R430 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R431 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R432 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R434 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R435 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R44 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R45 | 0662057M28 | RES. CHIP 12 5% 20X40 |
| R500 | 0662057N05 | RES. CHIP 18K 5% 20X40 |
| R501 | 0662057M92 | RES. CHIP 5600 5% 20X40 |
| R502 | 0662057M78 | RES. CHIP 1500 5% 20X40 |
| R503 | 0662057M98 | RES. CHIP 10K 5% 20X40 |
| R504 | 0662057M82 | RES. CHIP 2200 5% 20X40 |
| R505 | 0662057M84 | RES. CHIP 2700 5% 20X40 |
| R511 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R603 | 0662057N23 | RES. CHIP 100K 5% 20X40 |
| R605 | 0662057N23 | RES. CHIP 100K 5% 20X40 |

| | | |
|---|---|---|
| R607 | 0662057N13 | RES. CHIP 39K 5% 20X40 |
| R612 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R615 | 0662057N06 | RES. CHIP 20K 5% 20X40 |
| R670 | 0662057M94 | RES. CHIP 6800 5% 20X40 |
| R671 | 0662057M52 | RES. CHIP 120 5% 20X40 |
| R672 | 0662057M82 | RES. CHIP 2200 5% 20X40 |
| R682 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R683 | 0662057M43 | RES. CHIP 51 5% 20X40 |
| R700 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R703 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R707 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R709 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R728 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R729 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R730 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R731 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R732 | 0662057M26 | RES. CHIP 10 5% 20X40 |
| R752 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R800 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R801 | 0662057N01 | RES CHIP 12K 5% 20X40 |
| R833 | 0662057M66 | RES. CHIP 470 5% 20X40 |
| R835 | 0662057M76 | RES. CHIP 1200 5% 20X40 |
| R836 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R837 | 0662057N03 | RES. CHIP 15K 5% 20X40 |
| R847 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R900 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R901 | 0662057M01 | RES. CHIP 0 5% 20X40 |

| | | |
|---|---|---|
| R902 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R903 | 0662057N23 | RES. CHIP 100K 5% 20X40 |
| R904 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R906 | 0662057M50 | RES. CHIP 100 5% 20X40 |
| R907 | 0662057M01 | RES. CHIP 0 5% 20X40 |
| R930 | 0662057N33 | RES. CHIP 270K 5% 20X40 |
| S3120 | 4009368L01 | SW TACTILE RT ANGL SMD |
| S3121 | 4009368L01 | SW TACTILE RT ANGL SMD |
| S3122 | 4009368L01 | SW TACTILE RT ANGL SMD |
| SH1 | 2688276K01 | CDMA ZIFSIN SHIELD |
| SH2 | 2688748K01 | SHIELD M3 CDMA TCXO |
| SH3 | 2688275K01 | CDMA TX SHIELD |
| SH4 | 2688274K01 | CDMA RX SHIELD |
| SH5 | 2688278K01 | CDMA POWER SHIELD |
| SH6 | 2688277K01 | CDMA LOGIC SHIELD |
| TM3300 | 0687802K01 | THERM NTC 50K 1% 3950K 2012 |
| U120 | 5109940K28 | IC MMIC GAAS MXR W/IF TQ5M31 |
| U1200 | 5199422A01 | IC FLASH 16MB GT28F160C3BA90 |
| U1201 | 5109522E24 | IC SNGL OR GATE TC7SH32FU |
| U1203 | 5109522E23 | IC SNGL INV GATE TC7SH04FU |
| U1300 | 5109509A31 | IC SRAM 128KX16 HY62VF16201 |
| U1800 | 5109632D99 | IC CUST PAC MAX511EEE 16QSOP |
| U1900 | 5109923D36 | IC CUST CIA SC29100GRC2 J21K |
| U200 | 5109572E37 | IC GAAS SPDT SW SOT-363 |
| U2000 | 5109879E51 | IC CCAP LITE 1.8V K12E 48 QFP |
| U2020 | 5109781E78 | IC NEG LDO REG ILC7362 23SOT |
| U2200 | 5109923D46 | TSTR CUST COVIC MSOP-8 |

| | | |
|---|---|---|
| U2400 | 5109512F17 | IC VOLT REG MC33263NW-28R2 SOT |
| U301 | 4809863M16 | OSC MOD REF TCXO 16.8MHZ KT17 |
| U430 | 5109730C32 | MMIC RF PA CMM 0530 LC 00BT |
| U600 | 5109940K29 | IC MIX/EXC CDMA/AMPS ME3 32BCC |
| U680 | 4809283D66 | OSC MOD VCO 900/2000MHZ SMD |
| U700 | 5109879E19 | IC BICMOS ZIF/SYNTH SC79836GC |
| U831 | 5109768D06 | IC TEMP SNSR LM60CIM3X SOT23 |
| U832 | 5109730C33 | MMIC RF PHEMT PA CMM1530LC00BT |
| U901 | 5109522E24 | IC SNGL OR GATE TC7SH32FU |
| U930 | 5109512F17 | IC VOLT REG MC33263NW-28R2 SOT |
| VR3400 | 4813833B10 | DIODE SCHOTTKY .5A 30V |
| VR3600 | 4809788E06 | DIODE ZENER 6.8V UDZ6.8B |
| VR3601 | 4809788E08 | DIODE ZENER 8.2V UDZTE178.2B |
| VR800 | 4813830A73 | DIODE 2.7V 5% 225MW |
| Y1140 | 4809995L09 | XTAL QUARTZ 32.768KHZ MC-146 |
| 8487333K01 | | PCB CDMA MOD3 PORTABLE |
| 5199477A01 | | IC BICMOS CASPER 224 PBGA |
| 2311049A62 | | CAP TAN CHIP A/P 4.7 10 10 |